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The Coöperative Health Program of the American Republics

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THE Inter - American Cooperative Health Service in the other American republics is a practical illustration of a united approach to the health problems of a neighborhood. The initiation of this extensive public health campaign was motivated by the recognized importance of concentrated measures for health protection throughout the Western Hemisphere. When extensive application lags behind well established knowledge, contagion can wax rampant and unrestrained. Preventable and curable sickness and death have in the past, and can still successfully hamper war effort and establish barriers in restraint of trade and economic development. With these well proven facts clearly in mind, 18 of the other American republics have embarked upon a joint program with the United States, to marshal forces against the insidious attack of fatal and debilitating enemies to well-being and efficiency.

There is ample evidence that the interchange of scientific knowledge including medical work in foreign countries is one of the most important factors in cementing international friendship. Public health work can serve not only to protect the people in other countries but is also of paramount importance for safeguarding our own population.

The Inter - American Cooperative Health Services were organized to assist and implement the good neighbor policy at a time when the threat of German conquest was most serious and every possible means had to be used to combat the powerful Axis influence in the Americas. The Japanese invasions of countries in the Far East cut off practically all of our important sources of rubber, tin, cinchona and other vital products. We had to depend upon the other American republics not only for supplies of important materials but also for coöperation in the defense of strategic areas.

The provision of medical and public health services for persons directly engaged in the war effort is an important

function of the Cooperative Health Services. The control of malaria has received major emphasis. General activities include such features as physical examinations, vaccination, emergency medical care, the distribution of medicines, and the provision and supervision of elementary sanitation. In this fashion an attempt has been made to improve the health and efficiency of the workers in rubber areas, on cinchona and sisal plantations, in the tin mines, and in the rich, diversified mining regions of Brazil, as well as highway and railroad workers in several of the countries. Sanitation and other public health measures have been intensified around air bases and in areas where our armed forces are stationed.

In addition to this work, which is largely of emergency and temporary character, the Coöperative Health Services are planned to supplement and extend existing activities and to introduce new patterns in the provision of a sound plan for immediate and long-term disease control.

In accordance with the prescribed directives for the extension of public health, the campaign includes increased opportunity for the utilization of therapeutic and preventive measures through the construction, equipping, and operation of hospitals, dispensaries, clinics, and health centers; fundamental and widespread activities for improved water supply systems, for sewage disposal, insect abatement, and other sanitary measures; training of professional workers in their specialties, and education of lay groups for the provision and practice of healthful living; and direction and evaluation of control measures through field and laboratory investigation. These are the activities being developed to realize the objectives expressed in January, 1942, at the third meeting of Ministers of Foreign Affairs of the American Republics at Rio de Janeiro.

The delegates of all 21 American republics agreed that:

> The defense of the Western Hemisphere required the mobilization of the vital forces, human and material, of the American republics and
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> Adequate health and sanitary measures constitute an essential contribution in safeguarding the defensive powers and the ability to resist aggression of the peoples of the American republics.

Resolutions were adopted advocating the extension of inter-American cooperation in a plan designed to further well-being and strengthen the bonds between the nations of the Western Hemisphere. The Congress of the United States voted an appropriation and authorized the Coordinator to set up a corporate entity, the Institute of Inter-American Affairs, with power of attorney to administer funds and execute coöperative agreements with the other American republics.

The Health and Sanitation Division of the Office of the Coordinator of Inter-American Affairs was established in February, 1942, as one specialized branch of an organization that includes many other operations in informational and economic fields.

Close liaison is maintained with numerous governmental and civilian agencies. These include the Pan American Sanitary Bureau, the National Research Council, the Bureau of Medicine and Surgery of the Navy, the Office of the Surgeon General of the Army, the Army Medical School and the Army Medical Museum, the United States Public Health Service, the International Health Division of the Rockefeller Foundation, the Foreign Economic Administration, inter-American committees of professional associations, schools of public health, medical schools and universities.

The work now in progress in 18 of the Latin American republics is entirely on a coöperative basis. The funds

appropriated by the Congress of the United States for this purpose are administered through the Institute of Inter-American Affairs. This incorporated body has made a grant to each of the republics now coöperating.

The republic wishing to participate also contributes its share of funds, materials, and personnel. The direction of activities and the disbursement of the combined funds is determined by the joint agreement of a Chief of Party from the Institute and an appointee of the national government. The Chief of Party is the head of the coöperative organization known in most of the countries as the SCISP (Servicio Cooperativo Inter-Americano de Salud Publica), which is an integral part of the national department of health. In many places, the Service is continuing and extending activities previously initiated by the health departments, while in other countries, long needed programs are being introduced.

Directive, consultant, and technical personnel for the field parties are provided by both the division of health and sanitation and the health department of the republic, but the organizations are composed for the most part of nationals as professional and technical employees and other local workers. On January 1, 1944, there were about 200 members of field parties from the United States and 13,000 nationals of the other republics employed in the program, of whom some 600 were physicians, nurses, sanitary engineers, or other professional personnel. Practical nurses, sanitary inspectors, technicians, administrative personnel, and office employees numbered about 2,400 and 10,000 were skilled or unskilled workmen.

PREVENTIVE AND THERAPEUTIC SERVICES

Hospital or dispensary construction is under way or completed in 10 of the republics. In some instances this has consisted of repairs or additions to existing buildings. In others, badly needed new facilities are being constructed and equipped. Operation of infirmaries for Brazilian migrants is an important part of this program. In Ecuador, which has the largest hospital program, existing structures are being improved or replaced to provide more adequate in-patient care in 16 general hospitals, and two isolation, two maternity, a children's, and a tuberculosis hospital. Leprosaria are under construction in Paraguay and Peru.

In addition to buildings, other services are being provided for improved in-patient medical care such as sanitary facilities and surgical, laboratory, and x-ray equipment.

Health centers, clinics, and medical posts are of major importance in this plan for controlling the spread of disease. Over 100 such stations are now under construction or in operation throughout Latin America.

In El Salvador, the National Department of Health and the Service are coöperating in the development and expansion of health centers throughout the Republic. Four existing full-time centers in the principal cities now provide immunization, maternal and child health services, tuberculosis and venereal disease control, dental hygiene and laboratory facilities, with headquarters for nurses, sanitary inspectors, and other offices. The Health Department and the Service are providing permanent structures to replace the inadequate buildings now in use.

Fourteen centers have been maintained on a part-time basis by the National Health Department, and have made available certain health services such as vaccination and vital statistics. An attempt is now being made to extend the program as it functions in the full-time health units and to make maternal and child health and venereal

disease control services available on a part-time basis to 12 cities of from 5,000 to 15,000 inhabitants. The physicians in charge of the part-time work received a short intensive course in public health, provided chiefly by the staff of the Health Department with the assistance of a few of the outstanding physicians of San Salvador. The Service provided the allowance to each doctor for travel, subsistence and salary during the period of instruction. The entire cost of the operation of these health centers is being borne by the National Department of Health, with the exception of a limited supply of equipment and drugs necessary for the maintenance of the venereal disease program.

The Health Department has also provided doctors, sanitary inspectors, and full-time visiting nurses. The office space and certain supplies are in some instances being maintained by the local municipality.

The health center in Asuncion, Paraguay, was designed to provide clinic space in the building for tuberculosis, syphilis, leprosy, skin diseases, prenatal and maternal hygiene, clinics and a general medical diagnostic clinic to serve as a referral center. A diagnostic laboratory, x-ray rooms, pharmacy, and auditorium, demonstration center, and a waiting room are also on the ground floor. Offices of the Ministry of Health and the Director of Hygiene and branch departments are to be on the second floor.

Some medical care is being provided throughout the Amazon Valley by means of launches, and to workers on the Pan American Highway through mobile dispensaries. In the Republic of Honduras, five clinics and health centers operated by the Service reported 1,939 patients treated during a single month. By far the majority of the patients had malaria, with 887 cases reported, and intestinal parasitism was next in order of importance, with 276 cases.

SANITATION

The extension of environmental sanitation has its major emphasis on improved water supply and sewage disposal, with programs under way in 8 republics. In El Salvador, surveys of existing sanitary conditions within the city of San Salvador were undertaken to consider the problems of water supply, sewage disposal, garbage disposal, markets and slaughterhouses, in addition to health center activities and communicable disease control. Improvements in the water system were recognized as urgent, and three storage tanks have been completed, with provision for the chlorination of the entire water supply of the city. An improved and increased water supply is being provided for the city of Zacatecoluca. Sewerage systems are being constructed for San Miguel and Santa Tecla.

A country-wide community sanitation project is under way in Haiti. Facilities for excreta disposal, construction and sanitation of a rural market, and a slum clearance project have been completed at Port-au-Prince. Work is proceeding on similar projects in other communities, including small water supply systems, construction of public toilets, installation of school privies and septic tanks. In other republics the work also covers jail sanitation, garbage collection and disposal, and special projects involving supervision of sanitation at air bases and labor camps.

Near the upper end of the Rio Doce Valley at Itabira, State of Minas Gerais, Brazil, is probably the world's largest deposit of high-grade iron ore. There are also large deposits of manganese, mica, quartz, and other minerals in this valley. These resources cannot be fully developed without an extensive health and sanitation program to prevent and treat malaria and other diseases. Com-

panhia do Vale do Rio Doce has been formed with the Brazilian and United States Governments providing equal shares of the capital. The company will develop mineral resources and reconstruct the railway between Itabira and Vitoria, an Atlantic coast town in the State of Espirito Santo.

An agreement was entered into with the Companhia Vale do Rio Doce of Brazil and the Service for advice as to location and arrangement of labor camps and the supply and supervision of sanitary facilities.

The railroad is being relocated through a very low swampy region where malaria is endemic. Labor crews of 200 to 500 persons are provided for each unit of 10 kilometers of the right-of-way. About 27,000 persons, including workers and members of their families, are benefited by these activities of the Service. Epidemiological investigations and extensive malaria control measures are in operation in the camps. Sanitary supervision of the camps has included water supply and housing as main problems, with excreta disposal provided by bored hole latrines.

The sanitary engineering activities related to permanent mosquito control represent the most widespread type of environmental sanitation. Drainage, ditching and filling, and the construction of dikes and tide gates, as well as temporary control measures, have been initiated in 13 of the republics.

EDUCATIONAL MEASURES

The provision of training programs for professional workers in these republics has as its primary objectives the encouragement of specialization in medical and public health fields, to make available the services of an increasingly large and valuable group of well trained experts throughout the Americas. The Pan American Sanitary Bureau and the Rockefeller Foundation have done pioneer work in this field. The Division of Health and Sanitation is supplementing their activities by extending opportunities to increasing numbers of physicians, nurses, sanitary engineers, and other public health personnel for training in their specialties. A total of 142 persons from the other republics had already come to the United States by January 1, 1944, under the auspices of this program. Their courses of study include training in schools of public health, medical schools, hospitals, and other institutions and in urban and rural health organizations, and travel grants to observe the functions and activities of public health departments and other organizations in the United States.

A recent development is an intercountry training program which provides for limited periods of training, especially in field work, at selected places within the other republics.

Another important phase of the training program is the provision of nurses' training or organization of schools of nursing in Bolivia, Brazil, Colombia, Ecuador, El Salvador, Nicaragua, Paraguay, and Peru, with provision of or addition to buildings, equipment, and staffing. Together with this long-term coöperative program, short courses in practical nursing are also provided.

Short courses of instruction are being given locally in most of the countries to their own physicians in charge of full-time health centers, to sanitary inspectors and medical technicians. The courses are given by the staff of the coöperative program in collaboration with local health department or hospital staffs.

A proposed health center and field training station in the village of Boca del Rio, Mexico, will have the usual activities of a health unit for the welfare of the people and, in addition, will

offer intensive field training for physicians.

Health education of the lay public is recognized as essential to the recognition and popular support of the public health program. This is a function of all medical and public health activity through medical care, public health centers, and special disease control programs. Organized campaigns are under way or are being planned in almost all of the republics. In Paraguay, for example, the Department of Sanitary Education has arranged a series of regular radio programs on syphilis, tuberculosis and cancer, and a special "Health Week" series. Health films have been shown at educational meetings in schools, workers' centers, and factories. Articles are sent to the newspaper at regular intervals and a *Sanitary Bulletin* and special pamphlets are distributed to selected groups throughout the country. About 6,000 posters are displayed in public places.

The important contributions of laboratory and field investigation are being increased by the provision of facilities and personnel training in many of the coöperating republics, as well as by the use of services provided either by local existing laboratories or by those operated as a part of the coöperative program. Public health laboratories are being constructed in Bolivia, Brazil, Colombia, Ecuador, and Paraguay. Better diagnostic facilities will be available as a result of much of the hospital construction and, in many areas, as an important function of the coöperative health centers.

During May, 1943, a central nutrition laboratory for Colombia was established in Bogota. Analyses of salt, milk, fruit, vegetables, soil, and water have been made. The salt and water studies, indicating absence of iodine, are being used as the basis of a campaign against endemic goiter. The Institute of Epidemiology of Bogota has this nutrition research as one phase of its activities, which also include experimental work on typhus, bartonellosis, malaria, and rickettsiosis.

The laboratory work at health centers in Colombia has included blood counts; smears for rickettsia, blood parasites, and gonococci; serological reactions; and fecal, urine, and sputum examinations.

Extensive laboratory investigations are being conducted in Brazil where the staff, equipment, and buildings of the Malaria Control Service of the Northeast and of the Institut de Patologia Experimental Evandro Chagas, in Belem, were assigned to the Amazon Project of the Cooperative Service by the Brazilian government. The staff includes a trained entomologist, physicians, a microscopist, a photographer, technicians, and field inspectors. The activities of the Amazon Valley Laboratory include the investigation of malaria, filariasis, leishmaniasis and trypanosomiasis, in addition to routine laboratory work and teaching. Malaria studies have included species identification and the collection of parasitic and splenic indices. In the Belem area, the prevalence of filariasis in the human population and the infection rate in the intermediate host and vector have been studied. A survey is in progress to determine the species of *Phlebotomus* and their distribution in the Amazon Valley, and xenodiagnosis is being used in the study of trypanosomiasis. Routine laboratory work performed in conjunction with the Service activities has included bacteriological examination of clinical specimens, analyses of drinking water, blood matching, and stool and urine examinations.

CAMPAIGN AGAINST SPECIFIC DISEASES

Malaria—A primary objective in this crusade is the subjugation of malaria. The debilitation and destruction caused by this outstanding scourge are un-

equalled in severity and extent. Throughout most of the other American republics relentless war is being waged upon the mosquito and the parasites which it disseminates. Specific projects are in most instances preceded by entomological and engineering surveys; studies on incidence by obtaining splenic and parasitic indices; and the proportionate distribution of the species of malaria plasmodia. Engineering activities include the construction of dikes and tide gates, drainage, ditching, filling and spraying. Treatment and resultant control consist in the distribution of millions of tablets of atabrine from health centers and medical posts.

Coöperative malaria control has been initiated in Bolivia, Brazil, Colombia, Ecuador, Haiti, Peru, and Venezuela; and in each of the Central American republics, with activities concentrated along the route of the Pan American Highway. In Panama, the health and sanitation program consists entirely of some 50 projects devoted exclusively to suppressing the mosquito.

In the Amazon Valley, the emphasis is at present upon medical care for migrants and rubber workers, entailing the distribution of atabrine from infirmaries, medical posts, and dispensaries throughout the Valley. Mosquito control projects are likewise in operation, for with the overthrow of the heretofore triumphant and undisputed reign of the *Anopheles*, a vast region of potential resources should become available.

Extensive malaria control activities are being practised in many areas, but as illustrative of the program in a particular country, Honduras may be chosen as an example. Project No. 1, now completed, consisted of a reconnaisance survey in 18 principal cities of the republic for the purpose of securing an index of the amount of malaria in the country and to make certain initial technical studies in some of these cities to determine the practicability of instituting permanent malaria control. An initial sanitary survey was made of each town. Splenic indices and blood smears were obtained from representative groups of school children, mosquito surveys were conducted, and some topographical studies were made. Tables and maps were prepared showing mosquito and malaria distribution and rainfall data. The survey results were used in the concentration of attention on areas of primary importance.

A 22 acre lagoon near Amapala was found to constitute a prolific mosquito breeding area. The water is being cleared of matted growth and the borders freed of vegetation, with maintenance operations to be continued by the public works department of the municipality.

Temporary control was initiated in Choluteca with the location of breeding places and their periodic treatment with oil or Paris green. Permanent malaria control drainage initiated in this town is providing open drain channels to care for the run-off of rain water and thereby help eliminate mosquito-breeding water pools.

The surface water drainage system of the town of La Ceiba is being improved by re-laying certain portions of the system and by increasing its capacity through larger and more adequate size pipe.

Plans are being drafted for permanent malaria control operations in most of the towns, which have a combined population of over 100,000 persons to be directly benefited by these operations.

Tegucigalpa was omitted from the general survey as most of the information sought is already known for the capital city. As a result of engineering studies in certain sections of the city, a project is being devoted to oiling, or dusting, of stagnant pools in outstanding breeding areas and routine collec-

tion of larvae and adult mosquitoes. A permanent control project is being drafted for some areas.

In addition to the engineering activities, other public health services and medical care, including diagnosis and medical treatment, have been made available for the control of malaria among workers throughout the rubber producing area and along the Pan American Highway.

Health centers at Amapala, Choluteca, Nacaome, San Marcos de Colon, Tegucigalpa, and Trujillo distribute atabrine and information on the means of spread and of protection against malaria.

Tuberculosis — Tuberculosis is of serious import throughout the other American Republics, with mortality rates that in some areas are reported to exceed 500 per 100,000 population. A special concern of the health centers everywhere, and in some instances, of concentrated campaigns, tuberculosis control activities consist of case finding, education, study of contacts, provision of visiting nurses, and organization of record systems, supplemented by the construction of tuberculosis sanatoria.

According to the vital statistics collected by the National Department of Health, tuberculosis is one of the leading causes of death in Nicaragua. The department has an Administrative Division for Tuberculosis, but has been hampered by lack of facilities. The Service is starting a tuberculosis control project to provide the Department of Health with additional space and equipment. Health education and nursing personnel are being furnished through other Service projects, and facilities will include a mobile x-ray unit for case finding and follow-up clinics; x-ray equipment for taking of 4″ x 5″ films for the tuberculosis clinic of the Department of Health; and conversion of tuberculosis pavilions at the San Pablo Hospital, Bluefields.

Venereal Disease—The most extensive project involving venereal disease control is that conducted along the United States-Mexico border, in cooperation with the United States Public Health Service and the Pan American Sanitary Bureau. The Office of the Coordinator coöperated in this program by allocating the funds for the establishment and maintenance of the campaign as one of the many important special projects financed by this office. The activities include the awarding of special fellowships for study of venereal disease control; the organization and supervision of an educational campaign against venereal disease; and organization, supervision, and assistance in the execution of prophylactic measures. Enthusiastic participation by the Mexican Government is an important feature of the program.

In the Panama Canal Zone administrative services have been provided, including the establishment and maintenance of a central office of the Division of Venereal Disease Control of the Health Department of the Canal Zone.

At the request of the naval authorities, a coöperative project was initiated at Corinto, Nicaragua, for the maintenance of a clinic, at first primarily for examination of prostitutes, but since extended in the direction of a local venereal disease control program.

In health centers, dispensaries, and clinics throughout the republics emphasis is being placed upon the control of venereal disease. As a part of the health center program in El Salvador, for example, the attendant-physicians in 12 part-time health centers were provided with supplies of drugs for the maintenance of venereal disease clinics, and a strenuous attempt is being made to follow up contacts and bring them into the clinic for treatment.

Intestinal Parasites—Parasitic infestation is extremely widespread throughout the other Americas and it has been

estimated that, in some areas, 90 to 100 per cent of the population harbor intestinal parasites. The provision of safe water supplies and sewage disposal is a major means of combating this health hazard. These measures are supplemented by services directed principally through health centers and dispensaries for surveys of infested areas, health education programs, and mass treatment of infected persons.

At Tingo Maria Hospital, in Tingo Maria, Peru, a program has been developed for an intensive campaign against hookworm. Attempts will be made to examine the entire population of selected areas for hookworms, distribute and supervise the administration of hexylresorcinol, stimulate and perhaps subsidize in a small degree the construction of sanitary privies, and endeavor to make general the wearing of shoes.

Yaws—In Colombia, the Pacific Coast Sanitary Campaign has as its special objective the control of infectious diseases in the swampy lowlands along the southern part of the Pacific Coast where four health centers have been established. The treatment of yaws is a major feature of the program now being extended to areas further north in which the incidence of yaws is also high.

An important activity of the anti-yaws campaign in Haiti is the training of local personnel to assist in the organization and operation of rural treatment centers. According to Health Department records, there are estimated to be about 300,000 cases of yaws in Haiti. Attendance at the first yaws clinic opened at Gressier increased from 158 in March, 1943, to 917 in April, 2,181 in May, and 11,915 in October.

Typhus—Typhus fever study and control are under way in Colombia, El Salvador, and Guatemala. Plans have also been made for a coöperative project with the Pan American Sanitary Bureau for work in southern Bolivia. A research project on typhus fever in El Salvador is concerned with the isolation of the virus from rats as well as from patients. In Colombia, laboratory study of arthropods and blood specimens has been extended, and a roving commission is conducting experimental vaccinations. In Guatemala, epidemiological studies are being made to determine the prevalence of this disease with concomitant measures for control, including immunization of contacts and elimination of insect vectors. A serologist from the Army Medical School Laboratory spent two months in Guatemala City doing laboratory work during the preliminary survey and training technicians.

During October, 1943, a typhus outbreak occurred in a textile factory engaged in work directly associated with the war effort. Approximately 40 deaths had occurred from typhus during July and August, among a population of 1,000 factory workers and their families. In an attempt to control further spread of the disease, the owners of the factory agreed to hire a full-time medical officer and the necessary number of assistants, as well as to provide all the medical supplies. The National Health Department agreed to provide supervision and consultative medical services, and the Service agreed to provide personnel for teaching the medical staff and sanitary inspectors employed by the factory.

Plague—In Bolivia and Ecuador, plague control measures have been undertaken in conjunction with the Pan American Sanitary Bureau and local health authorities.

Work began in February, 1943, in an area in the south central part of Bolivia where bubonic plague has been endemic for a number of years, and several serious localized epidemics have occurred. Large numbers of domestic

rats and their ectoparasites are being studied. Sylvatic plague is also reported to be present.

Suppressive measures in Ecuador are being extended along the Guayaquil-Quito Railway and particularly in the endemic rural area of the Province of Chimborazo. The campaign is being directed toward the extermination of rats, fleas, and guinea pigs, for it is felt that evidence points definitely to the guinea pig as an intermediate host between rat and man. Trapping, poisoning, cyano gas flame throwers, and insecticide sprays are being used, and rat and flea killing measures have been repeated two or three times in most of the area.

Bartonellosis—The service in Colombia inaugurated, in March, 1943, a campaign against bartonellosis. Studies are being conducted for the investigation of the epidemiology, the mode of transmission, of the disease and the possible development of a vaccine for prevention.

SPECIAL PROJECTS

The Institute of Inter-American Affairs has also authorized the allocation of funds for a number of special projects. These are not under the supervision of the Services but constitute separate activities, many of them under the immediate direction of the Pan American Sanitary Bureau, such as fellowships in military medicine; additional public health nurses requested by the other American republics; the visit of medical and public health experts from the other Americas to the meeting of the American Public Health Association, and to institutions and cities of special interest; the collection of biostatistical and epidemiological information from the southern republics; and onchocerciasis control in Guatemala and Mexico.

SUMMARY

The work of the Inter-American coöperative health program is directed toward the control of the spread of infectious disease and toward the promotion of health by preventive and therapeutic measures. The extension of international health work is fundamental in a world where diplomatic exchange of notes, political treaties, and the opening of channels of commerce and transportation have long been recognized as necessary for the progress of civilization. The Inter-American health program has already proved to be an efficient means of cementing the friendship and coöperation that were absolutely essential to the Western Hemisphere at the outbreak of the present world war. All the republics have profited by the exchange of ideas, personnel, and materials with which this campaign has been related. A pattern has been established for the introduction and extension of health measures that are of importance not only to the persons immediately concerned but also over a far-reaching area.

The threat of disease is especially ominous at this time, for the waging of war has always been attended by marked increase in the prevalence of contagion among civilians and soldiers alike. The present program operates not only toward the alleviation of debilitation and death at those places where specific measures are provided, but also toward the prevention of disease spread among distant as well as nearby population groups.

In some areas, the other Americas have spent millions of dollars and employed thousands of persons on communicable disease programs which have ultimately benefited the United States. The people of this continent are greatly indebted to the successful campaigns initiated in Brazil for the eradication of *Anopheles gambiae*, imported from Africa and an especially dangerous vector of malaria. The measures directed against the *Aedes aegypti* in

Brazil and Colombia have aided in the solution of a problem which might have resulted in devastation of our own shores and necessitated expensive measures against yellow fever. Our present coöperative services are waging a war to prevent the dissemination of disease from one country to another.

Disease has through the ages followed the lines of transportation. With the increasing frequency and rapidity of travel, especially in cargo and passenger planes, previously adequate quarantine restrictions are weakened not only by hitch-hiking insect vectors but also by the conveyance of regular passengers who have become infected and are deposited in unprotected communities during an incubation period that terminates only subsequent to arrival.

With the provision of preventive and therapeutic measures, hitherto disease-ridden areas become more accessible for cultivation and development. Such measures, more than any other, can serve to stimulate the production of some important tropical materials that in the past have been largely limited to the Far East.

The coöperative effort is now serving in the interests of increased efficiency for war products and, with opportunity for development, there will come the growing purchasing power which is the necessary basis for the extension of commerce and support of trade. By the exchange of students, the provision of health center and hospital services, widespread health education, the improvement of environmental sanitation, and the use of specific control measures, a coöperative effort is being directed toward the more efficient preservation and utilization of human and other resources.

Wartime Nutrition in England as a Public Health Problem*

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AT this meeting two years ago Sir Wilson Jameson, the Chief Medical Officer of the Ministry of Health, told you a little about the nutritional surveys that are being made in England by the Oxford Nutrition Survey. I should like first to expand what he said and then to make some broad generalizations about the conduct of such surveys. I feel encouraged to do this because those of us who work in the field of human nutrition have usually been so engrossed in cultivating our own small part of it that we have rarely put down our tools and stepped back to see what crops or even weeds we are growing, and I have been permitted at least to put down my tools during the ten weeks in which I have had the privilege of visiting nutritional projects in this country and in Canada at the invitation of The Rockefeller Foundation.

Let me first, then, tell you very briefly of the development and organization of the Oxford Nutrition Survey. Its first seeds were sown in the summer of 1940, and they suddenly sprouted and rapidly grew a year later. At that bad period of the war in England our food policy was designed, as it still is, to save shipping for military purposes by keeping the population on the lowest diet compatible with health. It was obviously important, therefore, to watch the nutriture of the population, and that could only be done by making nutritional surveys. In May, 1941, we started to make such surveys with the backing of the Ministries of Health and Food, endeavoring to include so far as our resources permitted all reasonable methods. Obviously that was slow and laborious, but it was necessary to try all methods because of the uncertainty—to my mind—of most of the suggested ways of assessing the state of nutrition. However, it was clear that if we had a central organization making surveys in and around Oxford to test, develop, and apply such methods, it would be possible also to have a mobile team that could go out from Oxford around the country and make quick surveys using the methods that had been found to prove most useful.

We now have such an organization in Oxford, making detailed surveys for public health purposes and carrying out essential research; and we have a mobile team of three persons which spends about two months in any one town and examines the members of upward of 70 families in that time. The primary purpose of the whole organization has been to discover the incidence, cause, severity, and distribution of malnutrition in England.

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

THE DEFICIENCIES REVEALED

The main survey has now examined about 4,000 subjects. Probably the most serious problem in England is ascorbic acid; dietary intakes of about 20 mg. a day are quite common; and, being without citrus fruits, our main dietary sources are potatoes and cooked vegetables. There is also some evidence of deficiency of vitamin A, iron, and calcium, and possibly of animal protein and of fat; but there is little or no evidence of deficiency of total protein, thiamin, or riboflavin. We see much gingivitis and follicular hyperkeratosis, and a great deal of dental caries; but there is very little corneal vascularization of the type described by Sydenstricker. We have work in hand to try to interpret some of these difficult and doubtful signs. As Sir Wilson Jameson told you two years ago: "For a beleagured citadel we are being very well fed indeed," but "the margin of safety we possess must be very small." It has therefore been, and continues to be, important to watch that margin and to seek the earliest signs of malnutrition by carrying out reliable nutritional surveys.

COMMENT ON METHODS

I said that we have been testing all methods, and I might now add a few words about these, although much more work is needed to evaluate them. It is deceptively easy to use a method; it is surprisingly difficult to draw justifiable conclusions. It is worth remembering that a scientist's facts are usually right; his interpretations of those facts are usually wrong.

The sequence of events in the production of deficiency disease points the way to the four groups of methods that are available. Over a period of time a person eats food deficient in a nutrient, and that fact may be detected by dietary methods. Then the concentration of that nutrient may become diminished in the blood or tissues of the body, and that may be detected by biochemical analyses of blood, tissues, or urine. Later the function of the cells that are most dependent upon the nutrient may become deranged, and that may be detected by certain functional tests such as a measure of the dark-adaptation of the subject, or of the ability to appreciate vibratory sensation. Last, the structure of cells is deranged, and the anatomical changes that result may be detected by clinical methods. Therefore the tools of the dietist, biochemist, physiologist, and clinician are all involved.

I do not wish to go into details of these methods, but I may be allowed to make a few passing comments. Dietary surveys have been valuable in the past for providing evidence about food consumption habits and in assisting the planning of educational programs. But they are laborious, costly, and far more inaccurate than is usually supposed: errors come in at all stages of collection and calculation of the data. Then it is customary to interpret consumption of a nutrient in terms of the supposed human requirements, and our knowledge of these comes at present partly from guess-work and the guesses have not always been very inspired. And there are probably many factors, such as the interrelation between nutrients, that alter requirements and are at present unknown to us. When we have much more accurate knowledge of food composition, of human requirements, and the factors affecting them, dietary surveys may by themselves provide evidence of the extent of malnutrition. They do not at present.

Biochemical methods show great promise, and a number of different estimations can be done upon a small quantity of blood. But the difficulties of most of the methods of analysis are insufficiently appreciated. I have recently seen in the course of a survey

in this country blood drawn and routinely stood at room temperature for upward of 4 hours before the plasma was separated and treated for the estimation of ascorbic acid; great losses might have occurred. Hemoglobin, serum protein, blood (or plasma) ascorbic acid, serum phosphatase and vitamin A are particularly valuable. The first three are routinely included in our mobile surveys, and have been done on blood obtained by a finger-prick in a large survey of children. We have also recently been working on a micromethod for serum phosphatase. But the interpretation of blood analyses is a matter of very great difficulty.

We frequently find low plasma values for ascorbic acid: in the late summer and winter of 1941–1942, 76 per cent of the members of a sample of working class families in Oxford had values below 0.1 mg. per 100 ml. plasma. These values are taken by many biochemists to indicate scurvy, yet I know of no evidence that shows such values are incompatible with full health. In our main survey we have routinely estimated ascorbic acid in the leucocyte-platelet layer of blood since it is probable that this value falls to zero about the time that clinical signs of scurvy begin to develop, whereas a plasma value of zero has not been proved to indicate ill-health.

We perform several other estimations upon blood (such as riboflavin and thiamin), but none of these has yet proved practicable and valuable for rapid public health purposes at the present time. However, the estimation of all water-soluble vitamins in the leucocytes is a technic that may prove extremely valuable for detailed nutritional surveys; certain of them, such as niacin and riboflavin, can be present during clinical deficiency in blood in normal concentration but are low in tissues, and the leucocytes afford a convenient tissue to obtain in surveys. I know of no analysis of urine that can provide useful information about the state of nutrition in rapid surveys for public health purposes.

Tests of function are disappointing. Dynanometers, spirometers, and the like have had their day, and are now usually relegated to the attic. I still believe in the value of the dark-adaptometer, provided the machine and its operator are reliable and that only poor night-vision that improves significantly upon therapy with vitamin A is taken as a criterion of deficiency of that nutrient; such deficiency is not the commonest cause of poor night-vision in England, but it occurs, and can undoubtedly be diagnosed earlier by this means than by any other.

A clinical examination including biomicroscopy, a medical history, and a dietary history are absolutely essential in any proper nutritional survey. Unfortunately, however, the early clinical signs and symptoms of nutritional deficiency are almost without exception nonspecific; and the slit-lamp microscope is a tool that should only be found in trained and skillful hands, and even then it has not yet revealed any sign that has been proved to be specific. Photography is coming to be used widely in nutritional surveys, and it gives a useful objective record of certain findings; but I emphatically believe that it cannot yet replace an examination by a clinician. X-ray determinations of bone density are promising in the hands of experts; but estimates of capillary fragility, and all anthropometric determinations and indices (except height and weight) are of no proved value. The tools that the medical nutritionist can offer—or should offer—to the public health officer are therefore few. We need more.

TODAY'S DILEMMA IN NUTRITION

The great surgeon and philosopher, Wilfred Trotter, used to call attention

to the lamentable lag between scientific discovery and its application to public health, citing in particular Lind's clear demonstration of the method of preventing scurvy, and its adoption by the Royal Navy after nearly half a century and by the Mercantile Marine after 150 years. That lag still exists, but there is also a lamentable alacrity with which nutritional knowledge or nutritional guesses, derived almost entirely from work on lower animals, are applied to man. Perhaps the reason is obvious. On the one hand, the classical work of Sir Robert McCarrison, Sir John Orr, and others has abundantly demonstrated the tremendous effects of adequate diets and proper nutrition in maintaining sound health; and we know that malnutrition is widespread in many parts of the world although we are extremely ignorant of its precise epidemiology. On the other hand, the science of nutrition has made very rapid progress in the last few years, particularly regarding our knowledge of the nutrition of lower animals. Many have been anxious to apply that animal work to man; and fed by inadequate evidence a fire of uncritical enthusiasm to detect and treat imagined deficiencies has swept our countries, its flames fanned by certain political and vested interests, and when the scientists have left their laboratories they have not always lent a hand at the fire-engine.

Many useless surveys are being made; and many surveys are harmful because unjustified interpretations are put upon the results obtained. There is chaos in this field in both our countries, but it is not coördination that is needed: coördination has been cynically defined as the process of converting disorganized chaos into regimented confusion. We need more scientific knowledge.

THE NEED FOR ADDITIONAL RESEARCH

Since a knowledge of the incidence, severity, cause, and distribution of malnutrition is so important for public health, we must add to the few methods we already possess of eliciting that knowledge. Such knowledge is even more important in war than in peace, and it will be particularly needed as soon as parts of occupied Europe become liberated, when rapid nutritional surveys should immediately be made to discover the epidemiology of the malnutrition so that proper and adequate relief steps can quickly be taken and secondarily so that observations of nutritional deficiency in man can be made under conditions that should never occur again. Further, the United Nations at Hot Springs were pledged to make food consumption surveys and nutritional surveys after the war. To what source will they turn for advice in that important and integrated task? We have now only a few of the necessary tools, but others are almost within our grasp.

Since our emphasis must be on health in man, rather than on isolated abstractions culled from work on lower animals, we must learn more about the earliest methods of detecting departures from health due to nutritional deficiencies. That can only be done by experiments upon man. Centuries ago work on human nutrition was done by Sanctorio, and by William Stark who twice induced scurvy experimentally in himself and died of it in 1770 at the age of 29.

That work largely failed because the time was not ripe. But such work can and should now be undertaken on an adequate scale. We in Oxford have been studying such induced deficiency in man, using medical students, theological students, conscientious objectors, and ourselves. But no group in this country or in England has fully adequate facilities for properly carrying out such important experimental work.

NUTRITION AND PUBLIC HEALTH

Exactly 200 years ago Lavoisier, the founder of the science of nutrition and a public spirited man, was born. The time has now come to take stock of that science in so far as it affects public health, and it is perhaps the medical nutritionists, rather than the agriculturists or home economists, who should do so. For nutrition is one of the most important fields of public health, and agricultural policy must be guided by the nutritional needs of the people, which in turn are revealed by nutritional surveys controlled by research on human nutrition. And education, for which the home economists have done such excellent work, is an essential part of a national nutrition program and cannot be divorced from the broad field: a nutritional survey itself helps to interest people in what they should eat so that they will obtain their vitamins from their garden or grocery store, and not from their drugstore.

The public health field of human nutrition, then, is a broad one, and needs full coöperation among physicians, biochemists, home economists, and agriculturists. In England I hope we shall see a division of nutrition in the Ministry of Health working in collaboration with a department of human nutrition in a university, the latter carrying out research and applying it to nutritional surveys throughout the country — and perhaps clinical deficiency states will be included in the notifiable diseases. Then food policy will be guided by sound advice that springs from knowledge, experience, and scientific research directly and critically applied; and rapid advances will be made in what is perhaps the most important field in the domain of human welfare.

Staphylococcus and Streptococcus Carriers*

Sources of Food-borne Outbreaks in War Industry

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WHEREAS enteric infections form the principal type [1] of food-borne disease prevalent in Continental Europe, in the United States staphylococcal food poisoning [2] is probably the most common of all food-borne diseases. Since this disease is not reportable, we have no accurate knowledge as to the actual number of cases occurring annually. The control of food-borne disease is not only the concern of the epidemiologist [3] and of the public health officials, but also of every physician, food handler, and citizen, especially now that we are engaged in total war.

Gastrointestinal diseases are a major cause of absenteeism in industry. McGee and Creger [4] determined that 18.6 per cent of 40,942 days lost by employees of a Hercules Powder Company plant in New Jersey in 1941 were due to gastrointestinal disturbances. Of 5,402 absences from work, 24 per cent were due to this group of diseases. Of the 7,605 days lost from diseases of the digestive tract, 30.6 per cent were from gastrointestinal upsets and colon dysfunction, and 4.1 per cent from enteritis and dysentery. Most of the absenteeism from these causes occurred after week-ends and after holidays. We, ourselves, have repeatedly observed food poisoning disrupt a large war plant.

The health officer, the industrial physician, the industrial manager, the food handler, and the consumer himself play important rôles in controlling food-borne disease. Health officers are anticipating an increase in food-borne disease from public eating places and industrial cafeterias as a direct result of the war. More people are eating in restaurants because of the rationing of food and because of the placing of women in industry. There are increasing difficulties encountered in these restaurants. The lack of responsible personnel, trained in the sanitary and proper handling of food, the overburdening of the kitchen facilities, the unavailability of proper equipment, and, in some instances, the short cuts and improper processing of foods are the principal causes for the increase in food-borne disease. Horwood and Pesare [5] made sanitary surveys of public eating places in Rhode Island and concluded: "Ignorance of accepted

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sanitary requirements and procedures as manifested by the managers and employees of public eating and drinking establishments appeared to be the most important single cause of insanitary practices in such places."

In the investigation of any suspected food-borne outbreak, an analysis of the symptoms will often give the epidemiologist a clue as to the etiological agent. The enterotoxin of *Staphylococcus aureus* produces symptoms in 2 to 6 hours. Whereas fever is a common symptom of food-borne infections it is not a frequent finding in staphylococcus enterotoxin poison. Nausea, vomiting, abdominal cramps or pain and diarrhea leading to prostration are the usual rapid sequence in severe staphylococcal poisoning; chills, sweats, and toxemia are other frequent findings. The onset is more acute than in Salmonella infections, the duration is usually a matter of hours and recovery is rapid. In Salmonella infections, on the other hand, recovery is a matter of days.

In several instances, green-producing streptococci have been incriminated as the source of food-borne outbreaks. Linden, Turner, and Thom [6] reported two such outbreaks in both of which cheese was found to be the vehicle. *Streptococcus lactis* [7] when isolated from this food and fed to kittens produced symptoms similar to those caused by staphylococcus enterotoxin. Carey, Dack, and Meyers [8] isolated alpha-streptococci from canned sausages in an outbreak involving 75 persons. Living cultures of this organism fed to volunteers produced a syndrome clinically indistinguishable from staphylococcal food poisoning. Bacteria-free filtrates were non-toxic. Similar results were obtained by Carey, Dack, and Davison [9] in another outbreak caused by this organism. There is, therefore, some evidence that green-producing streptococci may cause gastroenteritis in man. However, unlike staphylococcal food poisoning, the toxic material is not contained in bacteria-free filtrates of this organism.

The clinical picture presented by this type of food infection resembles that of staphylococcal poisoning very closely. A differentiating feature is the longer incubation period found in outbreaks caused by green-producing streptococci. This usually varies from 5 to 18 hours, with an average of about 12 hours.

DEMONSTRATION OF THE ETIOLOGICAL AGENTS

The application of bacteriological procedures to the study of food poisoning must take account of the diverse etiological agents encountered in these outbreaks. Epidemiological and clinical data may suggest the identity of the causative agent as in botulism but are of less value in differentiating between the more common agents of food poisoning. Assuming the special technics necessary for the isolation and identification of the Clostridiae to be indicated or excluded clinically, the bacteriologist must provide technics adequate for the isolation and identification of: (1) staphylococci, (2) streptococci, (3) the enteric group. Staphylococci and streptococci were encountered in the outbreaks reported here. Members of the enteric disease group were excluded as possible causes by appropriate clinical and bacteriological examinations.

Nose, throat, and stool cultures were taken on all suspected food handlers. Swabs were cultured on 5 per cent horse blood agar and in beef infusion broth for 24 and 48 hours. Stool specimens were cultured on differential media for members of the enteric disease group.

Adequate epidemiological investigation usually reduces the number of foods suspected in a given outbreak. The foods thought to be responsible were brought to the laboratory im-

mediately or packed in dry ice for shipment.* Representative samples of each food were cultured in beef infusion broth on 5 per cent horse blood agar and differential media for the enteric disease group. Since chromogenesis varies with different media and cultural conditions, the differentiation of all staphylococci was made on the basis of pigment production on beef infusion agar incubated 24 hours at 37.5° C. No detailed study of colony variants was attempted.

The streptococci were classified according to the group-precipitation test described by Lancefield.[10] The serological type of Group A strains was determined by the slide-agglutination technic reported by Griffith.[11]

Casein hydrolysate filtrates were prepared according to the method of Favorite and Hammon.† [12] Filtrates were tested for enterotoxin by feeding to kittens and by the intravenous kitten test described by Hammon.‡ [13] Diarrhea and vomiting in 1 to 3 hours following administration of the filtrate was interpreted as a positive reaction.

The results of these toxigenic studies are summarized in Table 1. Unlike *Staphylococcus aureus*, the streptococci studied failed to produce an enterotoxic substance in casein hydrolysate but did produce a toxic substance in sterile tissue media which when administered intravenously to kittens induced an enterotoxic reaction. These substances could be readily distinguished from staphylococcus enterotoxin in that they were non-toxic by mouth. A detailed study of these tissue media filtrates has been reported by Foley, *et al.*[14] As has been the experience of others,[8, 15] whole cultures of streptococci produced enterotoxic reactions when fed to kittens.

There are conflicting reports as to the value of the various biochemical technics devised to distinguish enterotoxic strains.[16, 17] The "potential" enterotoxicity as judged by procedures other than the kitten test does not appear to be sufficient evidence to incriminate either a food or food handler as the source of illness.

Certain biochemical characteristics of the enterotoxic staphylococci isolated from foods and food handlers involved in these outbreaks are summarized in Table 1. Such tests are of some value in establishing the probable identity of strains but do not indicate enterotoxicity. There appears to be a rough correlation between alpha-hemotoxin titer and enterotoxicity as observed by Woolpert and Dack [18] but exceptions were noted.

ANALYSIS OF OUTBREAKS

It is well known that the staphylococcus and the streptococcus are ubiquitous in their distribution. They are found in the nose and throat of healthy persons where they become quite abundant during upper respiratory infections. They are readily isolated from superficial skin lesions and from routine air samples. In spite of modern aseptic surgical technics, they are often incriminated as the cause of postoperative stitch abscesses. It is, therefore not surprising that foods are often contaminated by them.

Our experience with staphylococcal food poisoning has demonstrated that it is by no means infrequent. The few outbreaks coming to the attention of public health authorities represent but a fraction of the actual number. Very often only the most dramatic incidents

* After bacteriological examination, samples were homogenized in a Waring Blender, mixed with milk or fish, and fed to kittens (4–6 months old) which had been starved the previous 24 hours. Typical "enterotoxic" reactions could be produced with contaminated foods by this method.

† In our experience, rotation was not essential to the production of an enterotoxin satisfactory for routine tests.

‡ Results of feeding experiments with original foods and casein hydrolysate filtrates agreed with those of the intravenous test with filtrates of the same strain.

TABLE 1

Summary of Epidemiological and Bacteriological Data, 18 Outbreaks, Food Poisoning

Out-break	Microörganism	Source	Fermentation of: Trehalose	Sorbite	Lactose	Mannite	Salicin	Enterotoxin	Alpha Hemo-toxin Titer	No. Ex-posed	No. Ill	Attack Rate
1	*Staph. aureus*	Food Handler	+	−	+	+	+	+	0.008	200	58	29.0
	"	"	+	−	+	+	+	+	0.008			
	"	"	+	+	+	+	+	+	0.008			
	"	Potato Salad	+	−	+	+	+	+	0.008			
	"	Ice Cream	+	+	+	+	+	+	0.008			
2	*Staph. aureus*	Food Handler	+	−	+	+	+	+	0.031 [1]	211	139	66.0
	"	Egg Salad	+	−	+	+	+	+	0.016 [1]			
3	*Staph. aureus*	Food Handler	+	+	+	±	+	+	0.125	Unknown	12+	Unknown
	"	Cream Filling	+	+	+	±	+	+	0.125			
4	*Staph. aureus*	Food Handler	+	+	+	±	+	+	0.125 [2]	Unknown	9+	Unknown
	"	Cream Filling	+	+	+	±	+	+	0.125 [2]			
5	*Staph. aureus*	Food Handler	+	+	+	+	+	+	0.125	2	2	100.0
	"	"Scotch" Ham	+	+	+	+	+	+	0.125			
6	*Staph. aureus*	Food Handler	+	+	+	−	+	+	0.004	800	180	22.2
	"	Boiled Ham	+	+	+	+	+	+	0.004			
7	*Staph. aureus*	Food Handler	+	+	+	±	+	+	0.008	Unknown	30	Unknown
	"	Corned Beef	+	+	+	±	+	+	0.008			
8	*Staph. aureus*	Food Handler	+	+	+	−	+	+	0.031	52	48	92.3
	"	Salad Dressing	+	+	+	−	+	+	0.031			
9	*Staph. aureus*	Food Handler	+	+	+	+	+	+	0.008	40	28	70.0
	"	Boiled Ham	+	+	+	+	+	+	0.008			
10	*Staph. aureus*	Food Handler	+	+	+	+	+	+	0.031 [1]	Unknown	60	Unknown
	"	Custard Pie	+	+	+	+	+	+	0.063 [1]			
11	*Staph. aureus*	Noodle Soup †	+	+	+	+	+	+	0.016	2	2	100.0
12	*Staph. aureus*	Boiled Ham Sand.†	+	+	+	−	+	+	0.008	70	**17**	**24.3**
13	*Staph. aureus*	Roast Turkey †	+	+	+	+	+	+	0.031	17	17	100.0
14	*Staph. aureus*	Boiled Ham †	+	+	+	+	+	+	0.008	3	3	100.0
15	* Beta Hemolytic Strep., Group A, Griffith Type 2	Food Handler	+	−	+	+	+	− [3]	.....	182	102	56.0
		Boiled Ham	+	−	+	+	+	− [3]	.....			
16	* Alpha Strep. Lancefield, Group B	Food Handler	−	+	−	−	−	− [3]	.....	Unknown	18	Unknown
		Cream Chicken	−	+	−	−	−	− [3]	.....			
17	* Alpha Strep. Lancefield, Group H	Food Handler	+	+	+	+	+	− [3]	.....	6	6	100.0
		Baked Beans	+	+	+	+	+	− [3]	.....			
18	* Alpha Strep. Lancefield, Group B	Chop Suey †	−	+	+	−	+	− [3]		3	3	100.0

[1] Difference of 1 tube in titration.
[2] Weak Enterotoxin in casein hydrolysate media. (Checked through kindness of Dr. G. M. Dack, University of Chicago.) Toxicity enhanced by culture in cream filling.
[3] Whole cultures and tissue media filtrates enterotoxic for kittens.
* Present in pure culture.
† Food handlers not cultured.

are reported. Sometimes newspaper accounts of such epidemics serve as the first notice to the health officer that something has happened. About half of the outbreaks listed in this paper took place in a single community. The interest of the health officer in this problem was a major factor in bringing most of these to light. We must assume that although rarely reported, similar episodes are a constant occurrence.

Certain of these outbreaks are more apt to become manifest than others. Institutional outbreaks, or those coming after a large gathering where a single meal common to a considerable number of persons has been incriminated, are readily detected. However, in other instances in spite of large numbers of cases, relatively few are reported. Outbreak 10 (Table 1) illustrates this point. The epidemiological investigation revealed that an infected pastry product had been shipped to numerous restaurants and diners in many different communities. For the most part it was sold in individual helpings. Although hundreds of potentially infected pies were distributed, only 60 cases came to our attention. For the most part these consisted of multiple cases occurring among small groups of persons who had eaten together at a single restaurant. In such groups the common source could be established without too much difficulty. "Car sickness" was considered the cause of one patient's illness with symptoms so severe that hospitalization became necessary. A newspaper account of the outbreak eventually led to the association of this case with the epidemic. In individual cases it is often very difficult to pick out any single food as the cause of symptoms. This factor alone tends to obscure the source of many outbreaks and is a definite asset to dirty and poorly managed food dispensing establishments.

The storage of food is an important factor in the morbidity rate. The longer the infected food is kept in a warm place, the greater the attack rates. In each of the outbreaks reviewed here, the epidemiological investigation revealed that the food was kept warm for a period of several hours. Thus certain procedures of food preparation may be the means of incubating pathogenic organisms accidentally introduced.

It has been assumed at times that bacteria harbored in the nose and throat of food handlers may be responsible for staphylococcal and streptococcal food-borne disease. Roberts and Wilson [19] in the study of one outbreak attempted to show that a strain of staphylococcus cultured from infected pastry was the same as that recovered from a food handler. Repeated cultures of this person revealed the same strain for a period of 4 months. Identical organisms were recovered from other food handlers in the bakery.

Our study demonstrates that staphylococcal food poisoning outbreaks may be traced to specific food handlers as sources of infection. In each instance where it was possible to culture the nose and throat of persons responsible for the preparation of an incriminated product, an apparently identical strain of *Staphylococcus aureus* was recovered from at least one of the food handlers and the infected food (Table 1). Although staphylococci are a universal contaminant of the environment, those strains harbored in the nose and throat of the food handler are invariably associated with outbreaks.

Figures collected from several sources [19] showed that the incidence of staphylococcus in the nose and throat of the general population was quite high, ranging from 76.3 per cent to 86.1 per cent in several different samples. Apparently all of these

strains were not chromogenic and only a portion of them were hemolytic.

Utilizing the kitten tests, we compared the incidence of enterotoxin-producing strains of *Staphylococcus aureus* in the nose and throat of food handlers involved in food poisoning outbreaks with that of other food handlers. There was a significant statistical difference between the two groups. Eighteen per cent of a total of 122 in the incriminated group harbored enterotoxin-producing staphylococci, while only 3.4 per cent of the control group of 146 carried such organisms.

Our study suggests that staphylococcal food-borne outbreaks are associated with a high enterotoxin-producing staphylococcus carrier rate among the incriminated food handlers. In four outbreaks, the incriminated strain was recovered from more than one food handler of a particular group. In one outbreak 3 members of the cafeteria personnel in an industrial establishment were found harboring the same organism as that isolated from the incriminated food. Moreover, this appeared to be the identical strain which had been recovered in a previous outbreak 7 months before at this very plant. Another group of food handlers was cultured 5 months after the occurrence of a staphylococcal food poisoning outbreak. Enterotoxin-producing staphylococci were isolated from 3 of the 21 members of this group.

Three of the reported outbreaks were attributed to green-producing streptococci. In two of these, apparently identical strains were recovered both from the incriminated food and the nose and throat of food handlers. Alpha-streptococci of Group H (Lancefield) were involved in one, and of Group B (Lancefield) in two. In each instance, kittens were made ill by whole cultures of the respective streptococcus, but not by its filtrate. The incubation period both in patients and kittens was prolonged as compared with staphylococcal food poisoning.

Green-producing streptococci belonging to Group H are a common inhabitant of the nose and throat.[20] The distribution of this organism should be borne in mind in the diagnosis of obscure food-borne outbreaks where the incubation period is somewhat longer than that of the staphylococcal outbreak and where no other bacterial or toxic agent is demonstrable. Alpha-streptococci of Group B are less frequently encountered[21] in routine nose and throat cultures. To our knowledge, these three outbreaks are the first reported food-borne epidemics produced by alpha-streptococci classified according to group-precipitation tests (Lancefield).

Outbreak 15 is of unusual interest. A beta-hemolytic streptococcus (Group A, Griffith Type 2) was established as the causative organism. The outbreak consisted of 24 cases of scarlet fever, 56 cases of septic sore throat, 7 cases of diarrhea, 7 cases of nausea and vomiting, and 8 cases of miscellaneous complaints. Gastrointestinal symptoms were unusually prevalent in all the patients. The identical strain of streptococcus was isolated from the throat of the responsible food handler, from the ground ham, and from the throats of several patients. Animal experiments and other laboratory procedures suggest that an enterotoxic substance may have been responsible for the unusually large incidence of nausea, vomiting, and diarrhea. Detailed descriptions of this outbreak and laboratory procedures are contained in other published reports.[14, 22]

Although three different groups of bacteria were involved in these eighteen food-borne outbreaks, carriers of a specific organism were the apparent source of infection in thirteen. In the five remaining outbreaks, food handling personnel were not cultured.

PREVENTION

One of the most effective methods of reducing food-borne diseases is the enforcement of proper personal hygiene practices by all food handlers. Keeping the hands away from the mouth and nose, covering the mouth with a handkerchief while coughing or sneezing, followed by washing the hands, covering foods whenever possible, refrigerating those that are perishable, reducing the interval between cooking and eating, eliminating food handlers with purulent wounds, boils, or infections of the hand, preventing food handlers with sore throats from preparing food—all these will reduce most of the instances whereby staphylococci and streptococci may contaminate food. One of the methods for controlling the ubiquitous staphylococcus in cream or cream-filled pastries is the rebaking of these delicacies as described by Stritar, Jungewaelter, and Dack.[23]

SUMMARY

Food-borne outbreaks in war plants may become an ever increasing cause of absenteeism among workers. Health officers, industrial physicians, and cafeteria managers working coöperatively may accomplish a great deal toward the prevention of food poisoning.

It must be borne in mind that although staphylococci and streptococci are found everywhere in the environment, food handlers carrying such organisms in the nose and throat are almost invariably responsible for food-borne outbreaks. In thirteen out of eighteen outbreaks reviewed in this paper, apparently identical organisms were recovered from incriminated food and the nose and throat of food handlers.

It is suggested that staphylococcal food-borne outbreaks are associated with a high enterotoxin-producing staphylococcus carrier rate among the incriminated food handlers.

Three of the outbreaks were produced by alpha-streptococci, the responsible organism in each instance having been classified according to group precipitation tests (Lancefield). One outbreak had as its etiological agent beta-hemolytic streptococci (Group A—Griffith Type 2).

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California Acts on Cheese-borne Typhoid Fever

According to a report recently released by Wilton L. Halverson, M.D., Dr.P.H., Director of Public Health of the State of California, approximately 76 cases of typhoid fever, all of Type C, have occurred in California during the period between April 9 and May 26. Seventy of these cases occurred in four counties, namely, Kern, Tulare, San Benito, and Monterey. Four additional cases have been reported from Nevada.

In view of the fact that all cases were of the same type and since all occurred during the same approximate time interval, it was assumed that the outbreak was from one source rather than from multiple sources.

Epidemiological investigation elicited the information that in various areas cases tended to trade at certain grocery stores. This was especially true in Bakersfield, where practically all of the 20 cases traded at one store.

The investigation elicited the information that the common factor was the ingestion of unripened, unpasteurized cheese of the Romano Dolce type, a type of cheese recently developed in California. When it became evident that well over 90 per cent of all the cases had ingested this type of cheese, a conference was called with representatives of the dairy industry, the University of California, the State Department of Agriculture, and the State Department of Public Health.

According to Dr. Halverson, after the data had been canvassed all concerned agreed that the evidence at hand called for immediate action, namely, the impounding of all cheese of this type as well as companion types manufactured in the same factories. To this end, action was immediately taken by the State Department of Agriculture, the regulatory agency for dairy products. An intensive investigation of the cheese factories producing cheese distributed in the areas concerned began. Because of complex and overlapping distribution systems, it was not possible to incriminate any single factory.

The previous call for an extraordinary session of the State Legislature for another purpose gave an opportunity to secure legislation to prevent a repetition. The Director of Health requested Governor Earl Warren to request in a supplementary call legislation which would correct this situation. The Governor immediately saw the importance of setting up safeguards to prevent a recurrence and as a result legislation was prepared, has been passed by both houses, and signed by the Governor, which provides that all cheese sold in the State of California must be pasteurized, must be made of pasteurized milk, or must be ripened or cured for a period of not less than 60 days. The bill also provides for proper labeling of the product whether manufactured in or out of the state, and contains an urgency clause which makes it effective immediately.

The short interval of time between the discovery of the cases and the cooperative action on the part of the State Departments of Agriculture and Public Health and the immediate action of the Legislature are notable.

Salmonellosis as a Public Health Problem in Wartime*

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UNDER war conditions, the control of diarrheal diseases, which are a constant threat to the health of our armed forces, industrial workers, and other civilians, is one of the problems demanding increasing attention by health departments. Overcrowding in rapidly expanding industrial centers, an ever-growing shortage of labor and a constantly shifting population, are some of the many factors operating in a wartime environment, which tend to increase the incidence of these infections.

The problem of controlling Salmonella infections is at best an exceedingly difficult one. There is complete lack of uniformity among the various states as to administrative practices concerning these diseases. In many areas, where Salmonellosis is not reportable, except for supervision of outbreaks no cognizance is taken of sporadic infections. On the other extreme, restrictions imposed by health authorities are sometimes excessively severe. One state requires that any person excreting paratyphoid organisms, but apparently well, shall be considered a carrier and kept under observation for one year even though repeated stool cultures are negative.[1] In one Army jurisdiction,[2] food handlers whose stool cultures are found to be positive on routine examination are hospitalized.

Such lack of unanimity is a direct result of the many unsettled problems concerning the epidemiological and clinical implications of Salmonella infections. If it were realized that permanent carriers, except of *Salmonella paratyphi B*, are not frequently discovered as sources of infection, much time would be saved in investigations. Because of the possibility of animal sources for cases occurring in man, human sources have often been ignored. Because some paratyphoid cases are very mild, it has been felt that, except in infants and the aged, these infections are inconsequential and merit no great amount of attention. The complexity of the problem is aggravated by the steadily increasing number of newly discovered Salmonella types.

The epidemiological investigations of sporadic Salmonella infections are by no means simple procedures. Table 1 lists the 22 types of Salmonella organisms recovered in Massachusetts since 1937, together with their possible hosts as recorded in the literature. It is apparent that these organisms have been isolated from many animals and that they are widespread among domestic and wild birds.

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TABLE 1

Previously Recorded Hosts of Salmonella Found in Massachusetts

Group	Type	Occurrence in Animals or Birds	Occurrence in Man: Disease	Occurrence in Man: Carriers
B	*S. paratyphi B*	(3) Chickens; (3,4,5) hogs; (3,6) cows	3	3
B	*S. typhimurium*	Many species of birds, animals	3	3
B	*S. chester*	(4,7) Hogs	3,7	20
B	*S. derby*	(3,4,8,9,10) Poultry; (3) ruminants; (4,5,6,11) hogs; (12) meat	3	3,20
B	*S. bredeney*	(3,4,8,10) Poultry; (3) ruminants; (4,5,11) hogs; (12) meat	3	3
C	*S. newport*	(3,9,10,13) Poultry; (3) rodents; (3,8) ruminants; (5) hogs; (15) fox	3,21	3,20
C	*S. oranienburg*	(3,4,8,9,10) Poultry; (10) quail; (13) birds	14,3	22,3
C	*S. montevideo*	(3,8,10) Poultry; (3) carnivores; (4) hogs	3,14	3
C	*S. cholerae suis*	(3) Poultry; (15) foxes; (5,11,16) hogs	3	..
C	*S. bareilly*	(3,4,8,9,10,14) Poultry; (3) carnivores; (4,11) hogs	3,14,21,23	3
C	*S. muenchen*	(3,8,10) Poultry; (7) guinea pigs; (5) hogs	7,21	20
C	*S. manhattan*	(3,17) Poultry; (3) hogs	17,3	17,3
C	*S. tennessee*		..	3
D	*S. panama*	(3) Poultry; (3) hogs	3,22	20,22
D	*S. enteritidis*	(3,8,9,13,16) Poultry; (3) rodents; (13) horses; (13) cattle	3	..
E	*S. anatum*	(3,4,8,9,10,13,16) Poultry; (16) ducks; (3) rodents; (5,11) hogs; (18) dogs	3	3
E	*S. give*	(3,4,8) Poultry; (11) hogs; (12) pork liver	3	3
E	*S. senftenberg*	(3,8,10) Poultry; (3) hogs; (12) meat	3,17	3,17
E	*S. newington*	(3,4,8,9,10) Poultry; (3) rodents; (11) hogs; (15) fox	3,17	3,17
Other	*S. kentucky*	(3,8,9,10) Poultry; (10) pheasants; (19) camels	3,17	..
Other	*S. worthington*	(3,4,8,10,17) Poultry; (11) hogs	3,17	3,17
Other	*S. urbana*	(3) Poultry; (3) Swine	17	17

Since outbreaks have been traced to infected meat, there is some likelihood that sporadic cases may arise from a similar source. Salmonella-infected horsemeat has been incriminated in several epidemics reported from Germany.[24] It is possible that the increased consumption of horsemeat in this country may present us with an additional source of infection. *S. muenster*[25] has been recovered from a person who developed food poisoning after eating raw horsemeat. Although, in general, meat incriminated in outbreaks has been traced to diseased carcasses, recent investigation[12] has revealed the presence of Salmonella organisms in the meat and organs of apparently healthy animals. Pork and pork products were more frequently infected than other meats.

Eggs belonging to several species of

birds have been occasionally established as sources of infection. Adult ducks and duck eggs [13] harbor several varieties of Salmonella organisms. It has been demonstrated [26] that *S. typhimurium* can penetrate the shell of duck eggs. Pigeon and goose eggs used in the preparation of puddings and salads have also been incriminated.[27, 28] *S. senftenberg* was isolated from a commercial egg preparation during the investigation of an epidemic in Massachusetts caused by *S. paratyphi B.*

Rats and mice may transmit Salmonella infection.[29] Surveys have demonstrated that wild rats harbor these organisms.[30] The house fly [31] and the mosquito (*Culex pipiens*) [32] may serve as additional vectors. Quite recently it was demonstrated that *S. enteritidis* may be transmitted experimentally by the Rocky Mountain wood tick *Dermacentor andersoni.*[33]

The multiplicity of sources and vectors is a troublesome factor in tracing sporadic cases. Such investigations are time consuming and, if a large proportion of these infections originate from animal sources, the prospect of successful control is not particularly bright.

PURPOSE AND METHODS

In 1937, during the investigation of several Salmonella outbreaks, the frequent occurrence of inapparent infection among those exposed to the causative agent was an interesting observation. In spite of detailed study, the sources of these outbreaks remained unknown. No direct association could be seen with either permanent carriers or animal sources. Subsequently, subclinical infection was often noted among the contacts of sporadic cases. One would scarcely postulate animal sources for Salmonella infections of formula-fed infants in immediate contact only with hospital personnel. The primary purpose of this study was, therefore, to evaluate the rôle of both unrecognized and inapparent infection in the transmission of salmonellosis.

Salmonella infection was declared a notifiable disease. All reported cases were investigated epidemiologically. Wherever possible, stool examinations were performed at suitable intervals in order to determine the total period of infectivity. Contacts were studied for evidence of either clinical or subclinical disease. All positive cultures were typed * and classified according to the Kauffmann-White schema.[34, 35] Clinical data were collected in order to acquire further information concerning the nature and severity of these diseases.

ANALYSIS OF FINDINGS

A. Epidemics

Table 2 summarizes our experience with Salmonella infections in Massachusetts since 1937. As one might expect, the number of epidemic cases varies considerably from year to year. Sporadic infections remain, on the other hand, at a fairly constant level. The increase noted during 1942 and the first 6 months of 1943 is due per-

TABLE 2

Salmonella Infections in Massachusetts

Year	Total Epidemic Cases	Total Sporadic Infections	Positive Routine Specimens	Total
1937	228	53	0	281
1938	16	68	3	87
1939	5	31	4	40
1940	73	60	13	146
1941	8	60	9	77
1942	26	90	12	128
1943 *	0	46	6	52
	356	408	47	811

* January to July, 1943

* Original isolations were made by the Bacteriological Laboratory of the Massachusetts Department of Public Health, and typing was performed by the Laboratory of the Department of Bacteriology and Serology of the Beth Israel Hospital, New York, N. Y., under the direction of Dr. Erich Seligmann.

haps to a greater interest on the part of physicians in these diseases. It is apparent that a rather extensive reservoir of Salmonella infection exists in our population.

Epidemics have been caused by seven varieties of Salmonella organisms (Table 3). *S. newington* and *S. senftenberg*, although not often the cause of clinical disease in humans, were each involved in a single small outbreak. Eleven of these incidents were food-borne and, with the exception of one epidemic in a neighboring state (two Massachusetts residents infected with *S. derby*),[36] all our food-borne epidemics were due either to *S. typhimurium* or *S. paratyphi B*.

Of the institutional outbreaks, three (one *S. typhimurium*, one *S. newington*, and one *S. cholerae suis*) occurred among the new-born of three hospital nurseries. In one of these, the infection was traced to a mother with a previously unrecognized Salmonella infection who shortly after delivery had infected her newly-born infant. The disease then spread to other infants in the hospital nursery. Further investigation in the mother's household revealed that the maid, a second unrecognized case, had initiated this chain of cases which resulted eventually in the death of one infant. There was one fatality in each of the three nursery outbreaks.

Not included in Table 3 is a "subclinical epidemic" of seven *S. montevideo* infections which were discovered in an institution where release cultures were being taken following an outbreak of Sonne dysentery. Not one of these persons manifested symptoms compatible with Salmonella disease.

B. Sporadic Infections

The investigation of 295 sporadic cases (Table 4) resulted in the discovery of 113 additional infections among the contacts, an increase of 38.3 per cent. Forty-six of these (41 per cent) were clinical cases while 67 (59 per cent) were subclinical. It is significant that the follow-up of 14 *S. paratyphi B* cases, 90 *S. typhimurium* cases, and 23 *S. newport* cases yielded respectively 27, 30, and 10 new infections among the contacts.

TABLE 3

Salmonella Outbreaks in Massachusetts 1937–1943 *

Salmonella Types	*No. of Cases*	*Remarks*
	A. *Food-borne Epidemics*	
S. paratyphi B	129	Infected bakery product
"	63	School lunch
S. typhimurium	29	School party
"	6	Dinner party
"	12	" "
"	31	School party
"	9	Dinner party
"	4	" "
"	15	Picnic
S. derby	2	Dinner party
Untyped	4	Picnic
	B. *Contact Outbreaks (Institutional)*	
S. typhimurium	6	Hospital nursery
"	27	" building
S. montevideo	8	" ward
S. cholerae suis	4	" nursery
S. senftenberg	5	" ward
S. newington	2	" nursery
Total	356	

* January–July, 1943

TABLE 4

Salmonella Infections According to Type and Manner of Discovery

Type	Epidemic	Sporadic		Contacts to Sporadic Cases		Routine Specimens			Total
		No.	Per cent	Clinical	Subclinical	Release	Food Handler	Incidental	
S. paratyphi B	192	14	6.2	11	16	1	1	..	235
S. typhimurium	139	90	45.7	16	14	5	1	2	267
S. newport	..	23	11.8	5	5	..	1	1	35
S. oranienburg	..	13	6.7	2	5	6	2	..	28
S. anatum	..	7	3.5	..	1	2	..	..	10
S. montevideo	8	6	3.0	1	..	9	1	1	26
S. chester	..	1	0.5	..	..	..	1	..	2
S. give	..	2	1.0	..	..	..	..	..	2
S. panama	..	7	3.5	1	1	..	..	..	9
S. derby	2	7	3.5	..	3	2	..	1	15
S. choleraesuis	4	10	5.1	..	..	..	..	..	14
S. havilly	..	4	2.0	..	1	..	1	1	7
S. kentucky	..	..	....	..	..	1	..	..	1
S. senftenberg	5	2	1.0	..	..	..	..	..	7
S. worthington	..	2	1.0	..	..	..	..	..	2
S. bredeney	..	1	0.5	..	..	..	..	..	1
S. enteritidis	..	2	1.0	..	2	..	..	..	4
S. muenchen	..	3	1.5	..	1	..	..	..	4
S. urbana	..	3	1.5	1	1	..	..	..	5
S. manhattan	..	1	0.5	..	..	..	..	..	1
S. newington	2	..	....	..	..	..	..	..	2
S. tennessee	..	1	0.5	..	2	..	..	..	3
Not typed	4	96	...	9	15	4	2	1	131
	356	295	100.0	46	67	30	10	7	811

Studies among the immediate household contacts of 237 sporadic cases revealed multiple infections in 59, or 24.9 per cent. Two, 3, and 5 infected contacts were discovered respectively in 12, 4, and 6 families.

The relative frequency of the several Salmonella types as determined by the occurrence of sporadic cases is given in Table 4. *S. paratyphi B, S. typhimurium, S. newport,* and *S. oranienburg* are the most prevalent types. All together they represent approximately 70 per cent of all our typed sporadic cases. When arranged according to year of onset, it is observed that the same general pattern of prevalence is maintained each year. Except for *S. montevideo,* which is an occasional finding in routine examinations, these same four types are among those most commonly encountered when routine stool cultures are being taken for one reason or another.

It has been stated in the literature [37] that children are more susceptible to Salmonella infection than adults. When all types are combined, our figures would seem to confirm this opinion. About 29 per cent of all sporadic infections occurred in the first decade of life although each succeeding 10 year period up to age 50 contributed at least 12 per cent or more to the total number of cases. However, when consideration is given to differences in type, we find that in our sample unusual susceptibility in children up to age 10 was shown primarily when *S. typhimurium* was the etiological agent. The percentage of cases under age 10 among the four most frequently encountered types in the sporadic group was as follows: *S. typhimurium* 39.1 per cent, *S. paratyphi B* 24.4 per cent, *S. oranienburg* 20 per cent, and *S. newport* 18.2 per cent. If the *S. typhimurium* cases are excluded from the total sporadic group, the proportion of cases in the age group 0 to 10 drops from about 29 per cent to 23 per cent. Because of the small number of cases,

TABLE 5

Persistence of Salmonella Infections

Week	*S. paratyphi B*		*S. typhimurium*		*All Others*		*Totals*	
	No. of Cases Still Positive	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*
1	203	100.0	239	100.0	268	100.0	710	100.0
2	203	100.0	214	89.5	255	95.0	672	94.6
3	168	90.7	155	65.0	198	73.9	521	73.4
4	125	61.5	102	42.7	156	58.0	383	42.7
5	93	45.8	62	26.0	114	42.5	269	37.9
6	75	36.9	48	20.1	96	35.8	219	30.8
7	55	27.1	41	17.5	77	28.7	173	24.4
8	44	21.6	31	12.9	56	20.8	131	18.5
9	33	16.3	25	10.4	42	15.7	100	14.1
10	23	11.3	22	9.2	37	13.8	82	11.6
20	17	8.3	11	4.6	13	4.8	41	5.7
30	13 *	6.4	8	3.3	8	3.0	29	4.1
40	13 *	6.4	8	3.3	7	2.6	28	3.9
50	11	5.4	6	2.5	6	2.2	23	3.2
60	10	4.9	3	1.3	4	1.5	17	2.1
67+	10	4.9	..	...	3	1.1	13	1.8

* Cholecystectomy was performed in one carrier at 30 weeks and one at 40.

no inference could be drawn regarding the more unusual types.

The distribution of the 295 sporadic cases according to the seasons of the year indicates that the highest incidence occurs in the summer and the lowest in the winter. The figures were as follows: spring 66, summer 116, fall 74, and winter 39. The cases were fairly evenly divided between the two sexes: 146 cases among males and 149 among females.

C. Laboratory Studies

1. *Persistence of Infectivity*—Infectivity of Salmonella cases persists for considerable periods of time. Table 5 summarizes the results of serial stool examinations in 710 (87.5 per cent) of our 811 cases. In the 4th week after onset of the disease, approximately 61 per cent of the *S. paratyphi B* cases, and 43 per cent of the *S. typhimurium* cases were still infectious. In the 8th week, the figures for *S. paratyphi B, S. typhimurium,* and all other types were 21.6 per cent, 12.9 per cent, and 20.8 per cent respectively. Excluding permanent carriers, 24 cases representing seven Salmonella types remained infectious for 6 months or longer. Seven of the 24 (1 *S. paratyphi B,* 5 *S. typhimurium,* and 1 *S. give*) continued to harbor the causative organism for at least one year and subsequently became negative.

There are many differences of opinion concerning the significance of positive stool cultures in healthy persons. Whether this condition is indicative of subclinical infection or merely temporary alimentary excretion is of some practical significance. Table 6 presents our findings concerning the persistence of positive stools in 123 cases of inapparent infection. Fifty-four per cent of these cases continued to excrete Salmonella organisms for 4 weeks, 22.8 per cent for 8 weeks, and 10.5 per cent for 12 weeks. The rate of decline in percentage of cases still positive each week approximates closely that noted for all Salmonella infections (Table 5). Seven of our permanent carriers presented no history of any illness suggesting clinical Salmonella disease and are therefore included in Table 6.

TABLE 6

Persistence of Subclinical Salmonella Infections

Week	*S. paratyphi B*		*S. typhimurium*		*All Others*		*Totals*	
	No. of Cases Still Positive	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*	*No. of Cases Still Positive*	*Percentage of Cases Still Positive*
1	36	100.0	34	100.0	53	100.0	123	100.0
2	36	100.0	34	100.0	50	94.5	120	98.5
3	26	72.1	20	58.8	43	81.0	89	72.3
4	19	52.8	12	35.4	36	68.0	67	54.3
5	15	41.6	6	17.7	29	52.8	50	40.7
6	14	38.9	6	17.7	25	47.1	45	36.6
7	11	30.5	6	17.7	20	37.8	37	30.1
8	10	27.8	4	11.8	14	26.4	28	22.8
9	9	25.0	4	11.8	9	17.0	22	17.9
10	7	19.4	2	5.8	8	15.1	17	13.8
11	7	19.4	2	5.8	6	11.3	15	12.2
12	6	16.7	2	5.8	5	9.4	13	10.5
13	5	13.8	2	5.8	5	9.4	12	9.7
14	5	13.8	2	5.8	3	5.7	10	8.1
15	5	13.8	2	5.8	2	3.7	9	7.3
49	5	13.8	2	5.8	2	3.7	9	7.3
67+	5	13.8	..	...	2	3.7	7	5.7

Our studies show that age has a decided influence on the duration of positive stools (Table 7). Infants under 6 months of age tend to remain infectious longer than older persons. Twelve (48 per cent) of 25 in this age group had positive stools for 14 weeks or longer. A similar but less marked tendency is noted in infants 6 months to 1 year. In contrast, among older children and adults the rate of fall is more rapid after the 10th week of illness. Of 46 cases at all ages with positive stool cultures for at least 16 weeks, 14 were under 1 year of age. On the other hand, permanent carriers are for the most part limited to the older age groups.

In 8 of the 14 cases under 1 year of age, the organism was *S. typhimurium*,

TABLE 7

Persistence of Positive Stools According to Age Groups

Week	*0–1*				*1–9*		*10–29*		*30–49*		*50+*	
	0–6 Months		*6–12 Months*									
	No. Cases Still Positive	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*	*No. Cases Still Positive*	*Percentage of Cases Still Positive*
1	25	100.0	11	100.0	133	100.0	255	100.0	152	100.0	103	100.0
2	24	96.0	11	100.0	129	96.0	246	96.5	139	91.4	93	90.3
3	21	84.0	7	63.5	97	72.0	202	79.2	108	71.1	66	64.1
4	19	76.0	6	54.5	75	56.0	137	53.7	85	55.9	51	49.1
5	14	56.0	6	54.5	52	39.0	95	37.2	54	35.5	43	41.7
10	12	48.0	4	36.4	11	8.2	12	4.7	22	14.5	19	18.4
20	8	32.0	3	27.3	2	1.5	3	1.18	14	9.2	10	9.7
30	3	12.0	2	18.0	1	0.7	3	1.18	12	7.90	7	6.8
40	3	12.0	1	9.1	1	0.7	3	1.18	12	7.90	7	6.8
50	2	8.0	1	9.1	1	0.7	2	0.78	11	7.23	5	4.9
60	2	8.0	1	9.1	..	...	1	0.39	9	5.92	4	3.9
67	1	4.0	..	...	..	...	1	0.39	8	5.26	4	3.9
67+	..	...	..	...	..	...	1	9.39	8	5.26	4	3.9

TABLE 8

Salmonella Infections: Widals According to Type

Type	No. of Cases Negative		No. Cases Suggestive Partial Positive		Total		Percentage of Cases Suggestive Partial Positive	
	Clinical	Subclinical	Clinical	Subclinical	Clinical	Subclinical	Clinical	Subclinical
S. paratyphi B	14	10	151	21	165	31	91.5	67.8
S. typhimurium	40	10	70	9	110	19	63.5	47.5
S. newport	5	2	10	1	15	3	66.7	33.3
S. oranienburg	3	3	4	..	7	3	57.2	.....
All other types *	11	16	18	..	29	16	62.0	.....
Untyped	28	8	43	5	71	13	60.5	38.5
	101	49	296	36	397	85	74.5	42.3
Total	150		332		482		68.8	

* *S. anatum, S. montevideo, S. chester, S. panama, S. derby, S. cholerae suis, S. bareilly, S. senftenberg, S. worthington, S. bredeney, S. manhattan*

the remainder being distributed among five other types. Three infants with *S. typhimurium* infections had positive stools for 1 year or longer, although freedom from infection was finally demonstrated in each instance.

2. *Widals*—Widals utilizing *S. paratyphi B* as an antigen were performed in 482 cases, 332 (68.8 per cent) of which manifested some reaction in a serum dilution of at least 1:40 (Table 8). This figure is influenced to a great extent by the large number of positive tests in *S. paratyphi B* cases (172 out of 196, or 87.7 per cent). Of 129 *S. typhimurium* cases, a rise in titer was found in 79 (61 per cent). Information concerning the widal tests was available for 81 subclinical cases; 34, or 41 per cent, were positive. The percentages in the two most common types were as follows: *S. paratyphi B*, 67 per cent (21 out of 31 cases); and *S. typhimurium*, 47 per cent (9 out of 19 cases). In 50 cases representing six Group C Salmonella types, we found an increase in titer in 21, or 42 per cent.

D. Permanent Carriers

During the course of our study, 15 permanent Salmonella carriers were discovered among the 811 cases (Table 9). Their distribution according to Salmonella type was as follows: *S. paratyphi B* 12, *S. oranienburg* 2, and *S. derby* 1. One *S. paratyphi A* carrier had been recorded several years ago. Twelve permanent carriers (5.1 per cent) developed among 235 *S. paratyphi B* infections; none among 267 *S. typhimurium* infections; and 3 (1.0 per cent) among 309 infections due to all other types. This indicates that permanent carriers are important reservoirs of *S. paratyphi B* infections.

Of these 16 carriers, 9 were convalescent cases which had been followed for 1 year. Seven of the 9 were type *S. paratyphi B*. In 2 instances, because of clinical symptoms referable to the gall bladder, cholecystectomy had been performed before the expiration of the usual observation period. One patient was cured of the carrier condition; the other died shortly after operation. Of the 7 remaining carriers, all of whom had been discovered in the investigation of sporadic cases, 5 were type *S. paratyphi B*. This was a striking finding because there were only 14 sporadic cases of *S. paratyphi B* in contrast to 281 sporadic cases due to other Salmonella types, among whose contacts only 2 carriers were discovered. The source-finding rate for the former was 35 per cent; for the latter, 0.7 per cent. In making this comparison we recognize that in an investigation it is impossible

TABLE 9

Permanent Salmonella Carriers
Massachusetts

Age	Sex	Salmonella Type	Total Known Duration of Positive Stools (Weeks)	Manner of Discovery	Results of Bile Drainage	Type of Infection
32	Female	*S. paratyphi B*	314	R *	not done	C ‡
37	"	"	308	R	" "	C
11	Male	"	202	R	positive	C
71	Female	"	169	E †	not done	S **
55	"	"	167	E	positive	S
45	"	"	108	E	"	S
35	"	"	105	E	"	S
42	Male	"	102	R	not done	C
42	Female	"	66	R	" "	C
64	"	"	52	E	" "	S
41	"	"	40	R	" "	C
56	Male	"	30	R	" "	C
67	Female	*S. paratyphi A*	80	R	" "	C
55	"	*S. oranienburg*	135	R	" "	C
44	"	"	104	E	positive	S
34	"	*S. derby*	148	E	"	S

* = Release culture on cases
† = Found in epidemiological investigation
‡ = Clinical infection
** = Subclinical infection

to demonstrate whether a healthy person discovered to be carrying a Salmonella organism is a permanent carrier or is suffering from a subclinical infection which will eventually develop into the permanent carrier state.

Bile specimens were obtained by duodenal drainage from 6 permanent carriers (4 *S. paratyphi B*, 1 *S. oranienburg*, and 1 *S. derby*). The etiological agent was demonstrated in the gall-bladder contents in each instance. This indicates that in permanent Salmonella carriers, if persistent excretion of the causative organism takes place only in the stools, the gall-bladder is the focus of infection. One *S. typhimurium* case had been followed for 67 weeks before the stools became negative. Examination of the bile 1 year after onset and while the stools were still positive did not reveal the organism. Another case of the same Salmonella type, with positive stools for 48 weeks, is still under observation. The gall-bladder had been removed from this patient many years before, and bile drainage performed quite recently did not demonstrae *S. typhimurium*. However, x-ray studies of the large bowel revealed diverticula which may account for the continued presence of the organism in the feces.

Three of the 16 carriers were males and 13 females. Except for a boy of 11, all our carriers were 32 years of age or older at time of discovery, the average age having been approximately 46 years. It is, therefore, apparent that some types of Salmonella organisms share with the typhoid bacillus [38] a predilection for the gall-bladder of the middle-aged female. Further investigation along these lines will differentiate those types which may in a certain percentage of cases localize permanently in the gall-bladder from others, like *S. typhimurium*, which may be harbored solely in the intestinal tract.

E. Clinical Manifestations

Clinical descriptions were available in 711 cases (Table 10). The principal groups were as follows: gastroenteritis, 425 cases (59.8 per cent); continuous fever, 110 cases (15.4 per cent); and subclinical infection, 162 cases (22.8 per cent).

In our experience, hard and fast dis-

TABLE 10

Salmonellosis: Clinical Diagnosis, By Types

Type	Gastroenteritis	Subclinical	Continuous Fever	Other *	Other Unrelated Disease	Total
S. typhimurium	189	39	13	3	1	245
S. paratyphi B	98	51	45	..	..	194
S. newport	15	6	6	..	1	28
S. oranienburg	9	13	3	..	..	25
S. montevideo	9	12	3	..	1	25
S. cholerae suis	7	..	7	..	..	14
S. derby	5	5	2	1	1	14
S. panama	4	1	3	..	..	8
S. urbana	3	1	..	..	..	4
S. anatum	2	3	1	..	..	6
S. give	2	..	..	..	..	2
S. bareilly	2	2	1	..	1	6
S. senftenberg	2	2	3	..	..	7
S. newington	2	..	..	..	..	2
S. chester	1	1	..	..	..	2
S. worthington	1	..	1	..	..	2
S. bredeney	1	..	..	..	..	1
S. enteritidis	1	2	..	..	..	3
S. muenchen	1	1	2	..	..	4
S. manhattan	1	..	..	..	..	1
S. tennessee	1	2	..	..	..	3
S. kentucky	..	1	..	..	..	1
Not typed	69	20	20	3	2	114
	425	162	110	7	7	711

* 4 abscesses (1 *typhimurium*, 3 untyped); 2 meningitis (1 *typhimurium*, 1 *derby*); 1 respiratory (*typhimurium*)

tinctions between Salmonella fever and septicemia were often unjustifiable. In some cases the clinical syndrome, having been initiated as typhoid-like fever, might easily have been regarded during its subsequent course as a septicemia because of septic localization. By the same token one might attempt to differentiate between typhoid fever and typhoid septicemia.

Of the 425 cases of gastroenteritis, 189 (44 per cent) were caused by *S. typhimurium*, and 98 (23 per cent) by *S. paratyphi B*. The remaining 69 typed cases (16 per cent) were distributed among 19 other Salmonella types. A considerable proportion of the *S. paratyphi B* cases (98 out of 143 clinical cases, or 68 per cent) manifested gastrointestinal symptoms. Although in several of these the intestinal symptoms became less prominent later in the course, they constituted, nevertheless, the most striking part of the illness.

Although *S. paratyphi B* cases represented only about 29 per cent of the total number (194 out of 711), this type accounted for 45, or 40.9 per cent, of all the continuous-fever cases. Only 13 *S. typhimurium* infections were included in this category. Continuous fever was the prime clinical manifestation in 6 *S. newport* cases and 7 *S. cholerae suis* cases.

Of 162 subclinical cases, 51 (31 per cent) were *S. paratyphi B*, and 39 (24 per cent) were *S. typhimurium*. A significant number of the *S. oranienburg* and *S. montevideo* cases were subclinical, namely 13 out of 25 of the former, and 12 out of 25 of the latter. Except for *S. cholerae suis*, subclinical cases were frequently noted among all the more commonly occurring types. No evidence of subclinical infection could be found in the examination of the contacts of 5 *S. cholerae suis* cases.

The first reported isolation of *S. tennessee* and *S. urbana* [17] from clinical

cases was made from Massachusetts patients. Previously the former had been recovered only from a healthy temporary carrier, and the latter from fowl and swine.[3]

In 7 cases the Salmonella infection appeared to be incidental, or secondary to some other disease. Three of these "incidental" cases proved to be fatal.

There were 17 other deaths among all our clinical cases, giving a fatality rate of 2.6 per cent. Several of the *S. typhimurium* deaths occurred among the aged inmates of an institution during the course of an outbreak.

Some estimate of the severity of Salmonella infections may be derived from the number of cases requiring hospitalization. Out of 295 sporadic cases, 180 (61 per cent) were admitted to hospitals by attending physicians. That severe cases are not limited to any particular age group is indicated by the fact that these hospital admissions were fairly evenly distributed among all ages. Seventy-one *S. typhimurium* cases were hospitalized even though this organism is usually said to produce comparatively mild infections.

COMMENTS

Further study is necessary in order to evaluate more definitely the rôle of animal sources in the human spread of Salmonella infections. It must be borne in mind that organisms of the bacillary dysentery group do not require animal hosts for their continued propagation. It is conceivable that the interchange of Salmonella organisms between man and other hosts may prove not to be the most significant factor in the epidemiology of salmonellosis.

We have in many instances observed the spread of Salmonella infections from case to case. We have seen how the proper recognition of one misdiagnosed case might have prevented eight infections among the contacts in two families. On at least three occasions nurses were infected while caring for Salmonella cases. In each instance transmission occurred without the mediation of animal hosts.

It is our belief that Salmonella infection spreads through the population in small groups of clinical and subclinical cases. Clinical cases may be regarded as indicators of lines of transmission which should be utilized in setting up barriers to check the spread of Salmonella infection.

Subclinical infections, unrecognized and unreported cases, are more important than chronic carriers in the epidemiology of Salmonella infections. It must be emphasized that temporary carriers are for limited times just as infectious as permanent carriers and are just as capable of producing food-borne outbreaks.

For all of these reasons, we have felt ourselves compelled to keep all reported Salmonella cases under observation as long as they remain infectious. By breaking chains of spread in this manner, we believe that many cases have been prevented. In keeping 67 infected food handlers from their occupation, it is possible that some outbreaks may have been averted. At the present time, when the control of diarrheal diseases is of extreme importance, we cannot feel justified in disregarding obvious sources of Salmonella infection.

SUMMARY

1. The stress of war conditions demands better control of diarrheal diseases. Salmonella organisms are important causes of such diseases.

2. This study is based upon 811 cases of Salmonella infection: 356 epidemic, 408 sporadic, and 47 discovered accidentally.

3. The 356 epidemic cases occurred in 17 outbreaks: 11 food-borne, and 6 contact outbreaks.

4. The 408 sporadic infections occurred in 295 households. Four types (*S. typhimurium*, *S. newport*, *S. paratyphi B*, and *S. oranienburg*) accounted for 70 per cent of the sporadic cases.

5. Investigation of 295 sporadic cases dis-

closed 113 additional infections among the contacts: 46 clinical cases and 67 subclinical.

6. Of the 711 cases in which clinical records were available, 425 (59.8 per cent) manifested gastroenteritis, 110 (15.4 per cent) continuous fever, and 162 (22.8 per cent) no symptoms (subclinical infections). *S. typhimurium* was the most frequent cause of gastroenteritis and *S. paratyphi B* of continuous fever. These two types were also the cause of 57 per cent of the subclinical infections.

7. All age groups are susceptible to Salmonella infection. However, 39 per cent of our sporadic *S. typhimurium* infections occurred in those under 10 years of age.

8. Convalescents are infectious for long periods: 43 per cent showed positive stools in the 4th week after onset, 18 per cent in the 8th week, and 11 per cent in the 10th week. Positive stools persist as long in subclinical infections. Positive stools persist longer in infants under 1 year of age, and longer still in those under 6 months.

9. Sixteen permanent carriers of Salmonella organisms have been recorded in Massachusetts: 12 *S. paratyphi B*, 2 *S. oranienburg*, 1 *S. paratyphi A*, and 1 *S. derby*.

10. Twelve permanent carriers (5.1 per cent) developed among 235 *S. paratyphi B* infections; none among 267 *S. typhimurium* infections; and 3 (1.0 per cent) among 309 infections due to all other types. This indicates that permanent carriers are important reservoirs of *S. paratyphi B* infections.

11. In all Salmonella types persistent convalescent carriers, subclinical, and unrecognized cases are more important sources of infection than permanent carriers.

12. Although Salmonella organisms are common to man, animals, and birds, the interchange between lower animals and man may prove not to be the most significant factor in the spread of salmonellosis.

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U. S. Public Health Service Scope Broadened by Legislation

On July 3 President Roosevelt signed a bill aimed to broaden the scope of the U. S. Public Health Service and authorizing federal grants for research by non-government institutions, larger appropriations to aid state public health work, and the establishment of a national tuberculosis program. The bill also provided that public health nurses might be commissioned under the Public Health Service.

The President's statement regarding this legislation was as follows:

The Public Health Service Act is an important step toward the goal of better national health. A constituent of the Federal Security Agency since 1939, the United States Public Health Service is one of the oldest federal agencies—and one in which the people have great confidence because of its excellent record in protecting the health of the nation.

The act signed today gives authority to make grants-in-aid for research to public or private institutions for investigations in any field related to the public health. It authorizes increased appropriations for grants to the states for general public health work.

It strengthens the commissioned corps of the Public Health Service for the enormous tasks of the war and the peace to come. Authority is granted to commission the nurses of the Public Health Service, just as the nurses of the Army and Navy are commissioned.

It provides for the establishment of a national tuberculosis program in the Public Health Service. Since adequate public health facilities must be organized on a nation-wide scale, it is proper that the federal government should exercise responsibility of leadership and assistance to the states.

In establishing a national program of war and post-war prevention, we will be making as sound an investment as any government can make; the dividends are payable in human life and health.

Food Poisoning Caused by Hemolytic Staphylococcus in a Defense Plant*

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THE nurse was called from the dispensary at Kodak Park at 8:30 p.m. on August 3, 1943, to attend two employees who were violently ill with nausea, vomiting, and diarrhea. Shortly afterward, calls came from various parts of the plant to treat many others. Patients reporting to the main Kodak Park dispensary completely filled every room. It was obvious that we were confronted with a major emergency caused by some gastrointestinal irritant. A hasty survey showed that all cases came from among those people eating the evening meal in one of our numerous cafeterias. Some were in a severe degree of shock with cyanosis and cardiac arrhythmias.

With our own facilities taxed to the limit, it was decided to request aid from the chief Health Officer of the City of Rochester, Dr. Arthur M. Johnson who is also chief of the Emergency Medical Service of the Civilian Defense Organization. He promptly dispatched Dr. Norris Orchard, Deputy Health Officer, to our dispensary while he himself went to the control center of the Emergency Medical Service, according to a predetermined plan for caring for major medical emergencies in this area.

Hospitals were notified that an emergency existed. Beds were made available, and the emergency wards were staffed in readiness for the arrival of patients while the ambulances were sent from the hospitals.

Dr. Johnson directed the flow of ambulances from the scene to the various hospitals so that there would be no more patients at any one hospital than could be adequately taken care of at one time. It might be mentioned that when this organization was set up, no one thought it would first be needed to serve food poisoning cases on a large scale.

Each ambulance carried one very sick patient and four ambulatory cases. These patients were tagged at our dispensary with name, address, and the medication administered clearly indicated on the tag. In some instances it was necessary to insist firmly that hospitalization was necessary.

Preliminary treatment in our dispensary consisted in evacuation of the stomach as quickly as possible. The finger method was used, together with the drinking of large quantities of tepid water. These methods were effective. By the time the patients had left the dispensary, all their stomachs had been emptied at least once, and in some instances several times. Five patients, desperately ill, received ¼ grain of morphine sulfate by hypodermic. As no one knew definitely the cause of the symptoms at that time, it was decided to hospitalize every patient. This

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 12, 1943.

probably was a good decision. Twenty-four patients were removed to the Strong Memorial Hospital, 15 to the Rochester General Hospital, and 10 to the Genesee Hospital. Treatments varied with the hospital but consisted in the main of forced fluids by mouth when tolerated and glucose and saline by vein. In one hospital magnesium sulfate by mouth, hypertonic salt solution by mouth, and oxygen to those who were cyanosed was used. Doctors and nurses worked long into the night.

Dr. David B. Jewett, senior physician at the Genesee Hospital, furnished a statistical analysis of the symptoms shown by 10 patients. All vomited, 9 had diarrhea, 5 very severely. All but 1 had abdominal pain, and in 3 cases the pain was very severe. Cyanosis was present in 2. Only 1 showed blood in the stool. There was 1 case of auricular fibrillation. The temperature was 100° or above in 7 cases, the highest being 103.2°. There was a leucocytosis of over 10,000 in 6 cases; the highest count was 31,000. In 4 cases there were albumin and casts in the urine. Cases at the Strong Memorial and Rochester General Hospitals showed in general the same signs, symptoms, and laboratory findings.

Dr. Charles M. Carpenter, for the Health Bureau, isolated hemolyzing staphylococcus in the vomitus in nearly all cases admitted to the Strong Memorial Hospital, and in some instances the same organism was isolated from the stool.

One patient later developed an acute appendix which was removed. Another developed suggestive symptoms but was not operated upon. One patient developed a low-grade pneumonia 6 days after his return from the hospital. This promptly responded to sulfathiazole therapy. There were no deaths. All cases, with the exception of the appendix case, returned to work after 4 weeks. Sixty per cent returned after the first week.

Eighty-one employees in all were affected. Thirty-two individuals who went home before being taken ill, or who went home rather than report to the dispensary, were treated either by home remedies or by the family physician. Their period of absence closely approximated those who were hospitalized. Symptoms in nearly all cases began from 2½ to 3 hours after a meal was ingested at the one dining room previously mentioned. The acute symptoms in most cases persisted through the night. For two or three weeks many patients complained of various aches and pains, abdominal cramps, and some degree of prostration. Most patients returned to work within 17 days.

One of our first interests, of course, was to determine the cause of this epidemic. It was soon evident that all the people affected had eaten their evening meal in one cafeteria, and they all had eaten corned beef.

The cafeteria system at Kodak Park consists of a main kitchen where food is prepared and distributed to various dining rooms about the plant. On the morning of August 3, 1,000 pounds of fresh corned beef was cooked and sliced with a mechanical slicer. It was distributed to five dining rooms. A portion was served at the noon and evening meals. After the noon meal, normal practice has been to take the unused portion of the food back to the main kitchen where it is refrigerated and prepared for the next meal. In an effort, however, to save gasoline, this practice was abandoned two months previously, and the plan called for refrigeration after the noon meal in the local cafeteria. This necessitated, in some instances, overloading of the refrigerators, as they were not planned to take care of this additional load.

There were no cases following the

noon meal. One patient ate corned beef at the same dining room both at noon and in the evening. This patient had no difficulties following the noon meal.

Closely following the episode, all food handlers were carefully examined by our Medical Department. One employee in the kitchen who handled the meat, presumably with a knife and fork, showed an infected, untreated laceration on the third finger of the left hand, culture of which, taken by the Health Department, showed a hemolyzing staphylococcus. From another employee with facial acne the same organism was isolated by the Health Department. This employee did not assist in the organizing or preparation of the food. It is assumed that the epidemic came about by the contamination of the corned beef by the infected finger. Quite possibly, although it was not proved, this meat was not refrigerated sufficiently in the ice box.

We are convinced that a daily inspection of the hands, arms, and forearms of the food handlers is necessary, and they should be asked at this time if they have any boils, pimples, or infections of any kind on any other part of the body. Ample refrigeration space should be provided for the proper refrigeration of foods, for it is known that bacterial growth proceeds very rapidly at room temperatures, and that standing for 5 or 6 hours is sufficient time for gross infection to take place. There should be some one person responsible for the carrying out of these precautions. Only eternal vigilance will keep a similar catastrophe from any large eating establishment.

We were acutely aware of the value of an organized Emergency Medical Service to the community. In any sizeable community it is possible for large numbers of people to be taken ill in this way or to be injured at one time, and an organization of this sort eliminates most of the confusion which is inevitable when large numbers of people require hospitalization within a short period of time.

Housing the Health Department—An Experiment in Rural Oklahoma

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CLEVELAND COUNTY is located in the central part of the State of Oklahoma. It is adjacent to Oklahoma County where the capital, Oklahoma City, and the State Health Department are located. It has an area of 555 square miles. It has no industry and most of the land is not specially suitable for farming. There are one city and three townships, each having a high school as well as grade schools. The 57 one-room schools are spaced at the traditional 3 mile distance from each other. The county government is in the hands of three county commissioners. Norman, the county seat, has the city manager form of government. At Norman are located the State University with a normal enrollment of about 6,000 students and the Central State Hospital housing about 3,000 mentally ill patients.

The population of the county has increased from 27,728 in 1940 to 31,028 in 1943. In 1942 the stable character of this small town, rural and university community, was altered profoundly. The establishment of four naval projects attracted thousands of construction workers. After the completion of the bases about 20,000 sailors and their followers moved in. Crop failure compelled many farmers to leave the county to seek employment in industry. Thus, the population of the rural areas became depleted, while the urban centers became congested. Several federal and local housing projects are under construction to relieve this situation.

The Cleveland County Health Department was established as a four-member unit in the fall of 1936. During the first two years its housing facilities were inadequate. It was located in discarded storerooms on the second floor of Main Street stores or auto repair shops. Its waiting room was the WPA sewing room, and visitors had to wade through bundles of old clothes to get into the one room which served as interview, examination, and treatment room. In one corner the director and the clerk shared the same desk. A notable improvement occurred in 1939 when the county commissioners rented a neat 5 room residence. In 1940 a new courthouse was erected and from the salvaged material of the old structure an annex was built to house the welfare departments, the food stamp office, and the health department. A community hall was included in the building. The whole department consisted of 5 rooms on the south which were not planned with any particular function in mind. A long hall served as a waiting room for patients as well as for clients of the welfare departments. In 1941 considerable equipment was added and the quarters were improved by venetian blinds and asphalt tile floors. By 1943 the staff had increased to a director, 2 sani-

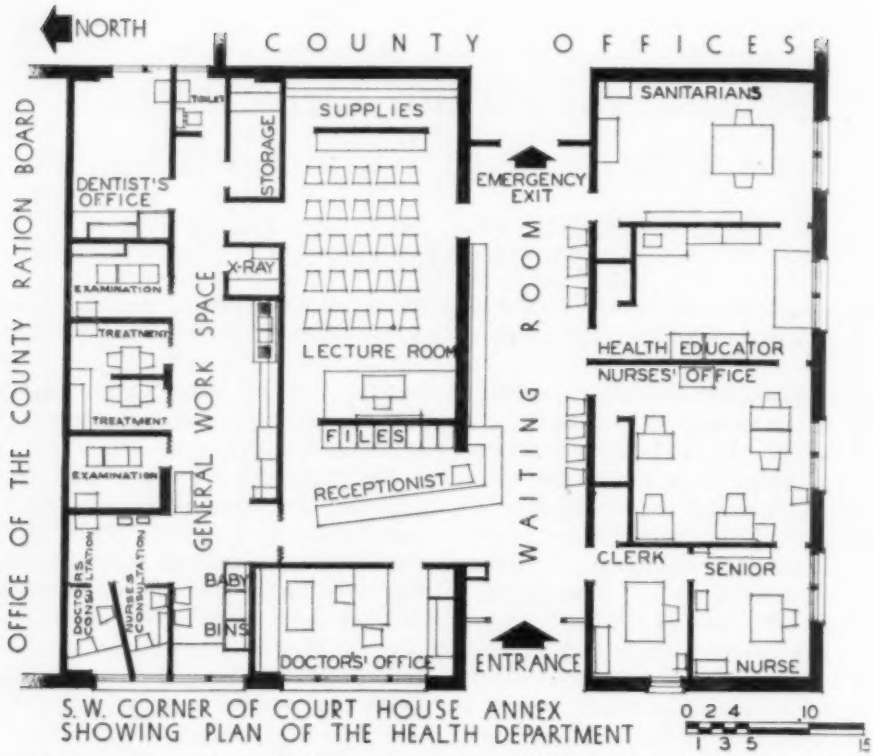

FIGURE 1—Floor plan. South of waiting room original quarters. North of waiting room newly converted space.

tarians, 5 nurses, 2 clerks, a follow-up worker, and a manual helper. The budget had grown from $9,000 in 1936 to $24,760 in 1943, that is, from 36 cents to 79.8 cents per capita. Obviously the housing facilities were quite inadequate to take care of the work load.

In January, 1943, an application for additional space was made to the FWA. In March, 1943, the sum of $10,000 was granted by presidential order, and the conversion of half of the community hall was approved by the FWA and the county commissioners. On July 1 the contract was let. The work started 2 weeks later and was completed in 10 weeks.

In making the plans the function of each new unit was first considered and then the whole was tied together so as to insure compactness and functional efficiency. The original 5 rooms were readily remodeled into offices for the clerk, the senior nurse, the nurses, the health educator, and the sanitarians. The original waiting room was retained as such, but by making a new outside entrance and changing the original entrance to an emergency exit, the whole department was separated from the rest of the building. This conversion was easily done with very little expense.

The space north of the waiting room had an area of 32 by 60 feet; the ceiling was 14 feet high and the windows were high and narrow. In the conversion the ceiling was lowered to 9 feet and the windows were lowered and broadened. The bare cement floor was covered with asphalt tile.

Somewhat over $7,000 was spent on

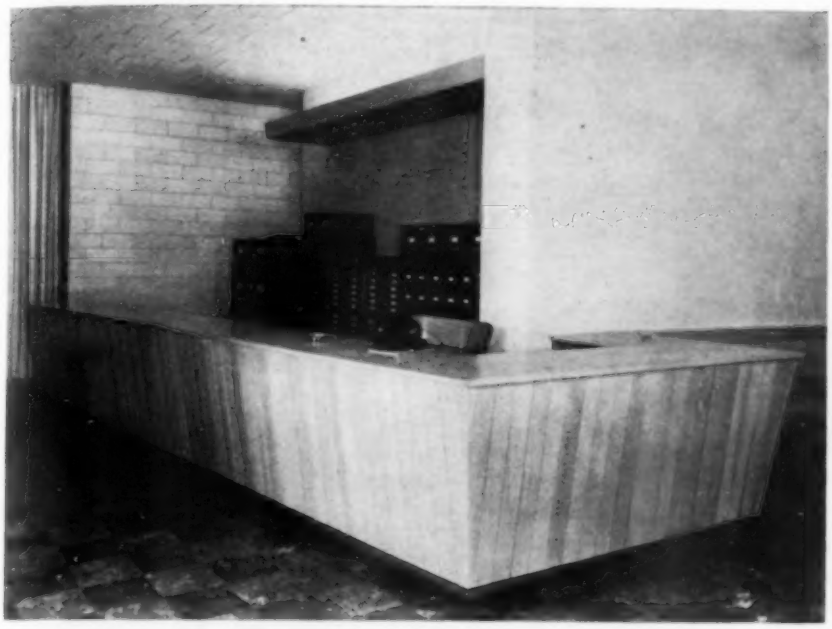

FIGURE 2—Waiting room with clerk's desk.

general construction in converting the old community hall into the various spaces and services as shown on the floor plan (Figure 1). Figure 2 shows the shape and simplicity of the general waiting room and clerk's desk. At the recommendation of the War Production Board, sani-finish tile walls were used to cut down on carpentry labor which at that time was critical in this area. All moldings, fixtures, extras, etc., were eliminated. Most of the lighting was from concealed sources, avoiding the use of expensive metal fixtures and giving better illumination. Many substitutes were worked into the scheme in line with the government's policy of conservation of critical materials.

Because of the definite limitation on exterior light or window space the function of the plan was carefully studied, and the services that could most easily be carried on without direct outside light were placed along the north wall, which was common to the Health Department and the County Ration Board. The clerk or receptionist was placed at a pivotal position to control the entire space, and the doctor's office was made easily accessible to all. All of the filing space was consolidated behind the receptionist's counter so as to be convenient for the clerk and easily accessible to the doctor and the nurses. Figure 3 shows the general work space with sink, refrigerator, and immunization table, with sterilizers on the right. Behind the curtained openings are two examination rooms and a treatment room. This room is divided into three spaces by a tile partition. With one set-up on the table the doctor can treat two patients alternately, with complete privacy for the patient.

The doctor's and nurse's consultation rooms were worked out with an oblique partition to handle the special

FIGURE 3—General work space. Behind curtained openings are two examination and two treatment rooms.

functions of their space. Figure 4 shows the arrangement of the latter room, and the bins for the undressing of the babies. Three babies can be handled at the same time under good natural and artificial light. A simple

FIGURE 4—Dressing room for infants and nurse's consultation room.

FIGURE 5—Director's office.

light trough above serves as shelf space for demonstration materials for the infant clinic. A shelf for scales and other equipment is conveniently located and ample room is provided for the mothers, out of the general circulation. Scales for the school children are placed against the wall facing the doctor's and the nurse's consultation rooms.

The doctor's office, shown in Figure 5, is a simple and workable arrangement of the requirements of the space. Figure 6 shows the class and demonstration rooms. The rear wall has an opening for a projector which is operated from the supply room. Blackboard, bulletin boards, speaker's rostrum and a lantern screen are an integral part of the room. This room is already a popular and valuable asset to the health department. On one afternoon a week a maternity class is held here. On infant and preschool and general clinic days demonstrations and films are shown. This room also serves as a meeting place for various health committees.

FIGURE 6—Class and demonstration room.

All of the space has been carefully studied for its particular use, with thought of simplification, ease of circulation, and efficiency. The cabinets have been worked out after a study of the use they would have. In the storage room there are a hot water tank and especially designed shelves for posters, school bags, incubators, etc. The supply room is lined with shelves and is for the storage of literature, and it consolidates this important part of the health program in an accessible and well organized space.

The arrangement can be easily adapted to special activities. On x-ray clinic days screens for individual dressing rooms for men can be set up in the lecture room and the examination rooms used for women.

In the preliminary development of the working arrangement, a study was made of published health department layouts, with considerable attention given to the comprehensive analysis of health department requirements made by Marshall Shaffer and August Hoenack of the U. S. Public Health Service in Washington, D. C.*

* Published in the *Architectural Record*, July, 1942. (Reprints available on request from A.P.H.A. office.)

Thirtieth Anniversary, New York City Bureau of Health Education

Commissioner Ernest L. Stebbins of the New York City Department of Health announced on July 1 that the Bureau of Health Education of the New York City Health Department had completed 30 years of activity. New York City was a pioneer in developing health education programs, the beginnings of which grew out of the tuberculosis campaign initiated in New York City in the early 90's and which demonstrated the superiority of educational measures over the former practice of mere police enforcement.

Since 1914 the Bureau has steadily expanded its facilities until today it makes use of every recognized publicity medium to teach good health to the residents of the city. During the past year each month there have been supplied to the public between 200,000 and 300,000 booklets and pamphlets on the widest variety of health topics and about 250 motion picture showings a month have been arranged. Extensive use of the radio has been made with frequent spot announcements, and neighborhoods are being organized as communities for educational projects against tuberculosis, diphtheria, syphilis, gonorrhea, and other communicable diseases as well as on behalf of a nutrition program. Savel Zimand is Director of the Bureau of Health Education.

An Automatically Controlled Suction Device for Field Air Sampling*

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IN practically all industrial hygiene studies and investigations, air sampling of contaminants is a necessary part of the procedure. For a few of these contaminants, special devices have been designed and constructed with which it is possible to determine their concentration directly in the field. For others a measured quantity of air may be obtained by the use of evacuated flasks, aspirating bottles or gas pipettes.

For the great majority, however, the technic consists of passing air at a suitable rate of flow through one or more absorption bottles, tubes, or similar devices capable of trapping the contaminant. After this is done the sample is brought in to the laboratory for analysis.

The volume of air to be thus sampled depends upon the sensitivity of the chemical method and the accuracy desired. Usually, the larger the sample taken, the more accuracy is possible in the chemical determination.

In regard to the chemical determination, we have the advantage of a variety of methods, the accuracy and sensitivity of which are usually well known and controlled. But it is well to remember that just because the chemical determination of the contaminant is accurate, it does not necessarily follow that the final result, that of the concentration of the contaminant in air, is equally accurate. This is due to the fact that the overall accuracy also depends upon the accuracy with which the air volume has been measured.

The measuring of the air volume, under field conditions, presents numerous difficulties which often result in errors far exceeding those associated with the chemical procedures. Furthermore, these errors are largely unpredictable because they are introduced as a result of various limitations in the measuring devices or conditions associated with the device used in aspirating the air.

The most common means used today for producing the necessary air flow through an absorber is some sort of a suction pump usually driven by an electric motor, but sometimes manually operated. The device used for measuring the air flow is either a vacuum gauge or, more often, the conventional Venturi type flow meter. While these instruments are capable of registering the air flow with good accuracy under controlled conditions, such as may be obtained in the laboratory, field conditions are often such that highly accurate information of the air volume sampled is difficult to obtain. This is due to the fact that these devices are not integrating the air flow over the entire period of sampling, but are only indicating the rate of the air flow at any given moment. Consequently if an ac-

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-second Annual Meeting in New York, N. Y., October 14, 1943.

curate estimate of the air volume is to be obtained it is imperative that the air flow remain constant. It is this requirement which is the most difficult to achieve, and the failure to maintain uniformity is, I believe, responsible for most of the errors associated with air flow.

When using motor operated pumps repeated line voltage variations cause corresponding variations in the motor speed and consequent changes in the rate of air flow. These variations become especially serious at low rates of flow if it is obtained by controlling the motor speed with a rheostat and thus causing the motor to run below rated voltage. Particularly is this true with respect to small fractional H.P. motors of the universal type which are desirable to use for reasons of versatility. Some improvement may be had by using a constant voltage controlled motor in combination with a bleeder valve in the suction line. However, our experience has been that this will not satisfactorily control the air flow, especially at low rates of flow. That is because constant voltage does not necessarily result in constant speed, it being achieved only when the electrical and frictional resistances have become constant.

Other disadvantages associated with the liquid flow meters mentioned are:

1. Accidental loss of liquid in transportation
2. Loss of liquid due to surges produced by stepping on the suction hose or accidental breaking of its connections
3. Condensation of water in extremely cold weather, causing water to enter the u-tube or condense on the orifice
4. Difficulties in changing orifices when widely different ranges of air flow are desired

Consequently, if highest accuracy is to be obtained it requires two persons to obtain a sample; one to operate the suction device and one to pay attention to the collection of the sample.

In order to overcome the above difficulties, all of which are detrimental to an efficient and accurate sampling technic, our office undertook to develop an improved type of instrument which in its final form proved to be satisfactory.

In planning this instrument, certain minimum specifications were set up which it had to meet to be considered successful.

1. Air flow should be automatically, or at least semi-automatically, controlled.
2. It should be simple in construction and at the same time rugged, and easy to operate.
3. It should be applicable to both low and high sampling rates with equal accuracy; that is, in the range from 0.5 liter per minute to 28.3 liters (1 cu. ft.) per minute.
4. Parts should be easily accessible in the case for cleaning and repair.
5. It should be light in weight for maximum portability.

Theoretically the problem looked relatively easy. Several schemes were tried with regard to controlling the air flow automatically, and instruments were built and tested. While they met the specifications with regard to flow control, they did not satisfy the above specifications in one or more respects. Not until an entirely new type of flow meter had been devised, was a satisfactory solution achieved.

Inasmuch as this flow meter is very easy to construct and has proved exceedingly accurate and useful in connection with hand operated suction devices, it will be described in detail.

Basically the flow meter consists of a vertical cylinder in which a piston is allowed to move freely. The piston is provided with an orifice the size of which depends upon the rate of flow desired. When suction is applied above the piston, air will flow through the orifice. At a certain vacuum the pressure on the underside of the piston will be great enough to lift it and make it travel up in the cylinder. When the piston is floating steadily at any one

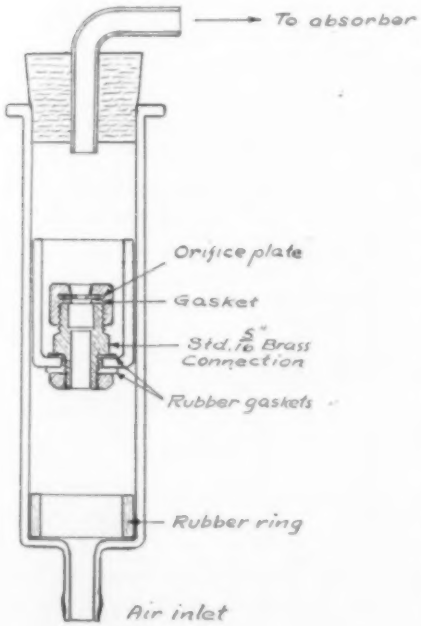
point, the air passes through the orifice at exactly the desired rate. A slight excess in the rate will make the piston rise, a slight reduction will make it fall.

In practice it is rarely possible to operate a suction device so uniformly that the piston will remain stationary for any length of time nor is that desired. It should be operated in such a manner that the piston is slowly rising and falling. *It is to be noted that the volume of air passing through the orifice in excess of the rated volume while the piston is rising a certain distance is exactly equal to the amount of reduction in air volume passing through while the piston is falling the same distance.*

Thus the average rate of flow will be exactly equal to that obtained if the piston were kept stationary.

Construction of the flow meter—A flow meter of the type shown in Figure 1 may be constructed from a 50 ml. hypodermic syringe. One discarded due to a broken tip will do as well as a new one.

FIGURE 1



The plunger should move easily in the barrel. Test it, after first inserting a rubber ring in the bottom of the barrel for protection, by holding it in a vertical position and letting the plunger drop of its own weight. It should travel smoothly and evenly to the bottom. Repeat the test a number of times, each time turning the plunger a fraction of a turn. If in any position the plunger should jam or slow up, indicating a tight fit, the barrel and plunger should be reground until satisfactory performance is obtained. This is easily done by making a thin slurry of fine carborundum powder in water, drawing a small amount of it into the syringe and working the piston back and forth with a rotary motion, turning the plunger now and then a fraction of a turn.

After having obtained the desired fit, have a glass blower replace the fine bore tip of the syringe with a 1″ piece of glass tubing, 6 mm. inside diameter, to serve as air inlet. Cut off the plunger 1½″ from the lower end and grind the edge flat. This piece will serve as the piston of the flow meter. Drill a 3/8″ hole in the center of the bottom of the piston to take a standard 5/16″ brass connection as indicated in the drawing. The brass connection is provided with an orifice plate made of sheet brass or lead and screwed tight by means of a cap against the seat which is covered with a gasket. The cap should be center-drilled with a 3/16″ drill. The size of the orifice is determined by the trial and error method.

It is of course possible to cement a suitable size orifice directly over the bottom hole of the piston and obtain desirable results. However, the use of the brass connection not only provides a simple means of exchanging orifices but also provides added weight to the piston. A heavy piston will be relatively less influenced by frictional resistance in its up and down move-

TABLE 1

Calibration Data

Test-No.	*Liters Passed*	*Time in Seconds*	*Rate of Flow lit./min.*	*Deviation from Average Per cent*
1	7.1	903	0.472	−0.21
2	7.1	901	0.473	±0.00
3	7.1	902	0.472	−0.21
4	7.1	899	0.474	+0.21
5	7.1	899	0.474	+0.21
6	7.1	901	0.473	±0.00

Average rate of flow = 0.473 lit./min.
Max. deviation from average = 0.21%

ments. A total weight of 45 to 50 gm. has proved to be the most satisfactory.

A piston may also be made from brass, as has been done in the instrument later to be described.

A flow meter constructed according to the above description was provided with an orifice to give a rate of flow of approximately 0.5 liters per minute. In calibration tests it was connected to an absorber and air drawn through by means of a midget impinger pump (which had been slightly altered to serve the purpose) and operated in prescribed manner. The air volume was measured by means of a wet meter.

As shown in Table 1 calibrations gave an average rate of flow of 0.473 liters per minute with a maximum deviation from the average of 0.21 per cent.

Automatically controlled air flow—The idea suggested itself that this device could be modified to control the air flow automatically. The simplest possible means for accomplishing this would be to let the piston itself cut off the air stream when the desired rate of flow is exceeded. Such an arrangement is shown in Figure 2. It is similar in principle to that used in the M.S.A. midget impinger.

In practice, this device would be operated so that the rubber pad attached on top of the piston would press against the air outlet.

Two different locations of this flow meter are possible; (1) in front of the absorbers, and (2) at the outlet of the suction device. In the former case, suction is applied to the outlet of the flow meter; in the second case, pressure is exerted at the inlet.

Table 2 shows calibration data for both locations under various conditions. The air flow was produced by means of a motor driven rotary pump. Inasmuch as it was desired to obtain figures which would reflect the maximum variations which it might be possible to obtain in the field by various operators, the suction pump was operated at arbitrarily chosen speeds without any attempts to obtain any check results. Study of Table 2 shows that while this control device after proper refinement might possibly be used if connected in front of the absorber, it is unsuitable if used on the outlet side of the pump.

For practical reasons, however, it is highly desirable to use the flow meter on the outlet side of the pump. Con-

FIGURE 2

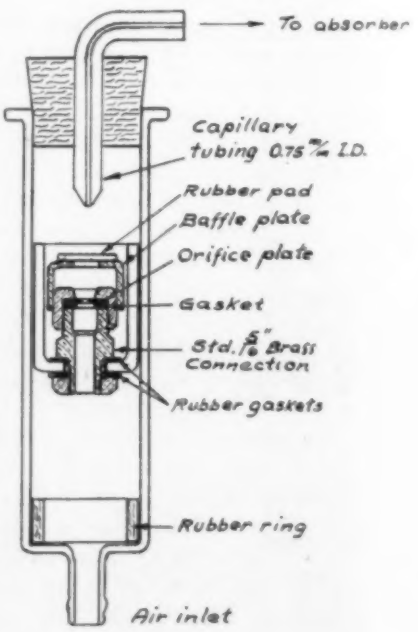


FIGURE 3

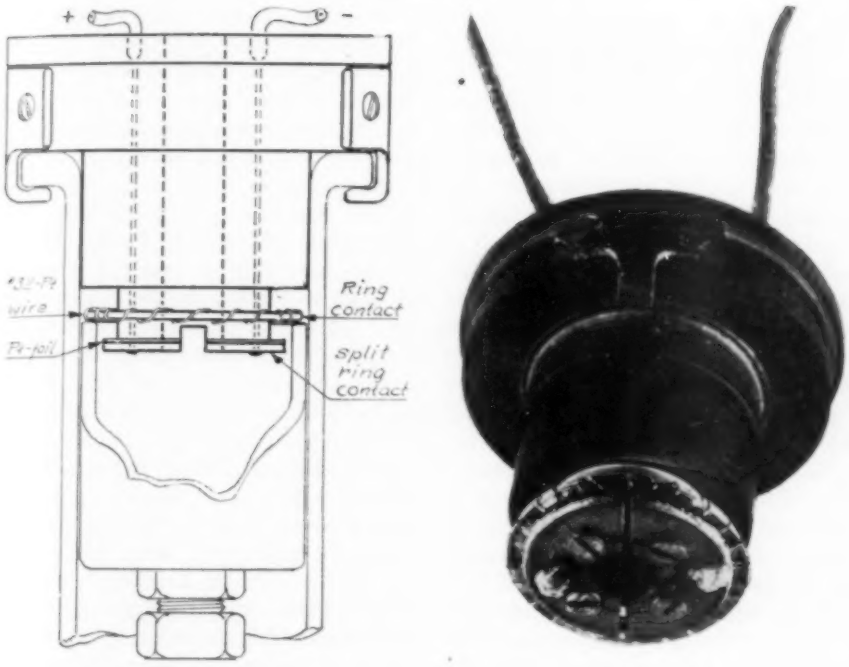


TABLE 2

Calibration Data

Suction

Test No.	Operation of Suction Pump	Rate of Flow lit./min.	Deviation from Average in Per cent
1	Slow—Just enough to raise the piston	0.479	−0.8
2	Increased speed	0.498	+3.1
3	High speed Air hose collapsed	0.492	+2.3
4	Same as No. 1	0.462	−4.3

Average rate of flow = 0.483
Max. deviation from average = 4.3%

Pressure

1	Low speed	0.535	± 0.0
2	High speed	0.774	+44.7

sequently, some other means of controlling the air flow had to be found.

As shown in Table 1 the most accurate air flow is obtained when the plunger is slowly rising and falling. It was felt that this mode of action should be maintained and be utilized for controlling the air flow.

The use of a photoelectric device, where the piston would interrupt a beam of light when rising to a certain point, was considered as a possibility for controlling the motor driving the pump. However, this was considered too delicate and complicated to incorporate in a field instrument and was abandoned in favor of a directly actuated switch. In order to obtain maximum reliability such a switch should fulfil the following requirements:

1. Have the capacity to carry the total operating current.
2. Produce instantaneous response when actuated.
3. Require minimum power for its operation; that is, not materially resist the movement of the piston.

4. Electrical contacts should resist corrosion and pitting.

After a number of different types of switches had been designed and tried, the design shown in Figure 3 finally proved satisfactory.

Essentially it consists of a metal ring of slightly smaller diameter than the cylinder, and free to move up and down a small distance. Normally this ring is resting on the two halves of a split metal ring permanently fastened to the lower end of a cylindrical plug made from plastics. The diameter of this split ring is slightly less than the inside diameter of the piston. Each half of the split ring is electrically connected to the opposite terminals of a fixed resistance which in turn is connected in series with the motor. The piston when traveling upward will eventually lift the ring, thus opening the short circuit which in turn slows down the motor, causing reduction in air flow. As a consequence, the piston will travel down until the metal ring again makes contact with the split ring and thus short circuits the resistance and speed up the motor. To insure good electrical contact, the ring contact is wound with platinum wire and the contact surface of the split ring halves covered with platinum foil. A suitable condensor is connected across the terminals of the latter to minimize arcing.

The plug may be turned from any convenient plastics. It should be provided with means of holding it securely in place in the top of the cylinder. A hole 3/8" in diameter bored through the center serves as an outlet for the air.

Inasmuch as very small fluctuations are accomplished by the plunger when in operation, it is best to provide a tripod on which the plunger rests when not operating. This may be easily constructed by soldering three stiff wires to the inside wall of a 1" long brass tubing of slightly smaller diameter than the inside diameter of the barrel. The points on which the plunger rests should allow a clearance between the plunger and the ring contact of from 1/4" to 1/2".

FIGURE 4

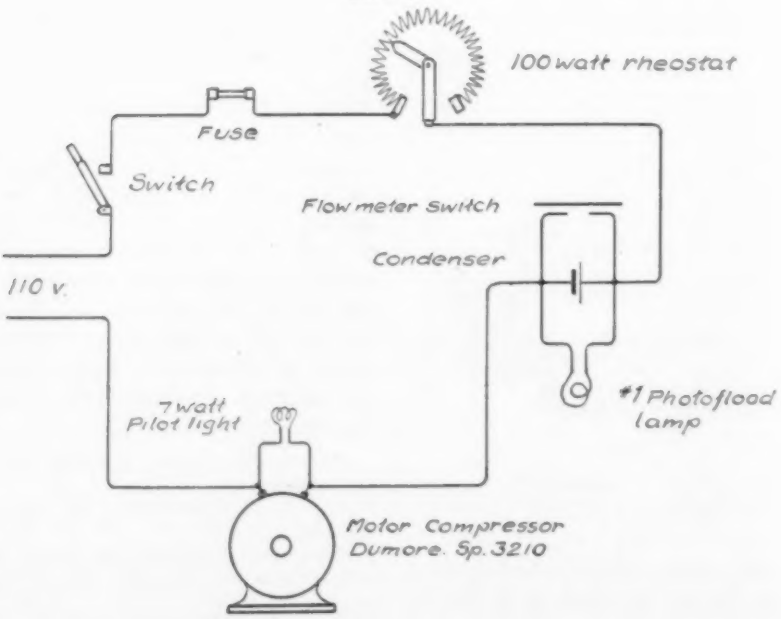


Figure 4 shows the wiring diagram of the assembly. For good operation the fixed resistance mentioned above should be so selected that approximately 10 volts variation occurs across the motor between the open and closed position of the switch at full load. With the type of motor compressor shown, this is achieved with a No. 1 Photoflood lamp. Incidentally this lamp may be used as a visual indicator of how the device is working. In the model shown, a pilot light visible through the panel also serves the same purpose. This light is connected across the terminals of the motor. It enables the operator to see at a glance even from a considerable distance whether the collection device is working properly or needs adjustment. A fast flicker of the light indicates proper operation. If the light is steady the speed is either too slow or too fast.

No lubricant is used or needed. As a matter of fact, if lubricant is applied the piston will stick, which prevents the device from functioning. For this reason a trap, preferably filled with copper wool, should be connected in the line between the pump and the flow meter to prevent the accidental entry of oil into the cylinder.

Hinged panels on the case are provided to permit easy access for inspection, cleaning, and repair. A trap is located on the inlet side of the pump identical in construction to that on the outlet side. These traps not only serve as protection for the pump and the flow meter but also act as mufflers against the otherwise noisy operation of this type of pump.

Table 3 shows calibration data obtained with this instrument. An effort was made to simulate the various ways the instrument might be operated by different operators. Thus the maximum deviation of 0.95 per cent shown in the table should represent the highest error to be expected at any time. While this in itself is an extremely good performance, even better results may be obtained if each individual operator calibrates the air flow, running the instrument in the same manner as he would do it in the field. Personally, being familiar with the instrument, I have no difficulty in obtaining any number of calibrations showing less than 0.5 per cent variations.

Theoretically there should be no difference in the rate of flow when absorbers of different resistances are used on the suction side. In the previously shown calibrations one absorber was used in the tests because with this type of absorber we have as yet

TABLE 3

Calibration Data of Automatically Controlled Suction Device
(one absorber used)

Test Run No.	*Manner of Operation*	*Volume of Air Passed Through Flow Meter*	*Time of Run*	*Rate of Flow lit./min.*	*Deviation from Average in Per cent*
1	Lowest practical speed—Lamp resistance barely glowing	56.8 lit.	27'03"	2.10	−0.95
2	Low speed — Lamp resistance glowing faintly	"	26'58"	2.11	−0.47
3	Higher speed—Lamp resistance glowing strongly	"	26'44"	2.12	±0.00
4	Highest practical speed—Lamp resistance glowing very strongly	"	26'27"	2.14	+0.95
5	Motor started cold the following day — Operated like Sample No. 2	"	26'45"	2.12	±0.00

Average rate of flow = 2.12 lit./min.
Maximum deviation from average = ±0.95%

found no need for greater numbers when sampling. However, recognizing the possibility that such occasion might occur the experiment recorded in Table 4 was performed. Notice the high vacuum required for these absorbers at this rate of flow. The drop in rate of flow becomes progressively higher with each additional absorber.

TABLE 4

Comparison Between Rates of Flow When Using Different Numbers of Absorbers in Series

Number of Absorbers Used	*Suction Required Inches of Mercury*	*Rate of Flow lit./min.*	*Variation of Flow in Per cent*
1	2.5	2.12	±0.0
2	5.0	2.08	−1.9
		2.08	
		1.97	
3	7.5	1.99	−6.6
		1.98	

While this performance was not noticed when the instrument was new but showed up in this test after about 150 hours of operation, it must be taken into consideration if the pump has to work against very high resistance. It is caused by air leaking in through the bearings of the rotary pump. Consequently it is advisable, as is the case with all these devices, to make periodic calibrations, and especially when unusually high vacuum is to be used for inducing the air flow.

The instrument just described and demonstrated has proved itself exceptionally trouble-free. This is probably due to two factors: the presence of the protective traps on each side of the pump and the reliability of the switch. The latter is, of course, the source from which most of the trouble would be expected. However, since the instrument was built and passed through the experimental stages, it has been in use approximately 150 hours, during which time the switch has opened and closed without a single failure for an estimated million and one-half times, a record which seems rather satisfactory.

While the instrument as described was designed to meet our own demands for portability and refinements, I see no reason why the control device could not be successfully adapted to some of the already existing suction devices. I suggest that you try it. If you succeed I shall feel happy to have contributed, in whatever small degree it may be, to the achievement of that other freedom we also so ardently desire, namely, freedom from trouble.

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CLIFFORD CAUDY YOUNG

THE death (on June 5) of "Cy" Young was a blow to the cause of public health in the United States and a saddening loss to the hosts of his friends and colleagues.

Born in 1887, Young took his A.B. and M.S. at Kansas, studied for a time with Sedgwick at M.I.T., and received the degrees of Dr.P.H. (1924) and D.Sc. (Hon., 1942) at Michigan. He served for two years as an officer (S.C.) in the First World War, and was appointed Director of the Bureau of Laboratories of the Michigan State Board of Health in 1919—a position which he held until his death. He married Minna Crooks, one of his associates in the laboratory in 1925. He headed the Department of Preventive Medicine and Public Health of the Wayne University College of Medicine from 1931 to 1938. He was a Charter Fellow of the A.P.H.A.; and served as Chairman of the Committee on Meetings and Publications (1932–1936) and member of the Executive Board (1941–1944).

The Laboratory of the Michigan State Health Department was Dr. Young's life work and will always remain his monument. Beginning with thirty-six thousand diagnostic tests, he built this branch of service up to over one million tests a year. He developed a state-wide system for the supply of completely free biologic products; and among the many fruits of this system was one of the most sweeping reductions in an initially high diphtheria death rate ever accomplished in the United States. He was a pioneer in the control of goiter by iodization of water supplies; and one of his last major accomplishments was an admirable program for supplying free blood plasma to every citizen in need of that almost magic remedy. Paul de Kruif has stated that this state laboratory was "one of the most functionally beautiful and powerful life-saving institutions in human history."

We have used the words "served" and "service" three times in this brief editorial; and it is an idea which is inevitable in connection with "Cy" Young. His complete technical skill and great administrative ability was infused with an almost passionate zeal for bringing the fullest resources of medical science to

every man, woman, and child in Michigan. De Kruif has said that, in the death of Dr. Young, "our state has lost the most valuable of all its citizens."

To all public health workers, the career of Dr. Young should be a reminder of the real significance of what we are doing, and trying to do. Steadily and undramatically—often without public recognition—the health officers, the engineers, the doctors, the nurses, the laboratory workers, and the rest are rendering a service which represents one of the most precious of all contributions ever made to the welfare of the human race.

THE NEW WORLD ORDER

THE aims of the American Public Health Association are primarily technological and relate to the clarification of objectives and the improvement of procedures in the field of public health practice. Public health is, however, one of the most far-reaching of human endeavors. It cannot be limited by national boundaries, since the disease germ operates under all flags. The recently discovered new type of epidemic jaundice is a problem in Berlin and in Moscow, as well as in Cairo. Nor can the specific challenges of public health be separated from the wider problems of national and international economics. The first step in the control of tuberculosis and infant mortality—in France, in Poland, in China—must be the provision of food for starving populations and the restoration of those populations to a status of economic independence.

The health officer, with his colleagues in the various specialties of public health, has a vital interest in the development for the post-war period of a world health organization of some sort. Whether it should be based on a reactivation of the Health Section of the League of Nations (which is still in being), or the health services now being developed by UNRRA, or on some new organization yet to be created, is a problem for the future. It is certain, however, that we need international machinery to maintain a world-wide system of epidemiological intelligence; to provide consulting field service and grants-in-aid to nations needing help in dealing with special problems; to negotiate sanitary conventions; to establish international technical commissions for the coördination of the best available knowledge in regard to malaria, venereal disease, tuberculosis, maternal and child health, housing, nutrition, medical care, and the like; and to coördinate facilities for the training and distribution of personnel. An outline of possible approaches to the "International Organization for Health" has been prepared and is available for study and criticism.[1]

The public health worker, as a citizen—and somewhat more directly than the average citizen—should also be concerned with the larger framework of international association, of which international health must form a part. The future of the world is being decided on the battlefields of Europe and the South Pacific. It is also being decided by deliberations of the chancelleries of Washington and London and Moscow; and these deliberations must be largely guided by intelligent and informed public opinion.

Two books have recently appeared which should materially aid us, in the United States, in the development of such an opinion.

There are two real dangers to be avoided, the Scylla and the Charybdis of international planning. The first of these is hopeless pessimism—which is fostered and reënforced by the sinister influences of special vested interests and narrow isolationism. As an antidote to this trend, *How to Think about War and*

Peace, by Mortimer J. Adler [2] may be recommended. Mr. Adler looks far ahead. He gives us a blueprint of a world order which he admits may not be reached for five hundred years; but he demonstrates with clarity that such a world order is logical and necessary as an ultimate ideal.

In the United States, wise planning on an international scale is, perhaps, more endangered by undue optimism than by over-pessimism. We are too accustomed to think that Utopia may be attained at one leap by a world conference and the signing of a set of resolutions. Perhaps this point of view is influenced by the common conception that our own Declaration of Independence and Constitution emerged from nothingness by an act of creative imagination. We should remember that these documents represented the distillate of some centuries of democratic experience in the England from which the founding fathers came. Social institutions grow by practice; they do not emerge, like Minerva, full-fledged from the brain of Jove.

To the over-optimist, *How New Will the Better World Be?* by Carl L. Becker [3] may be strongly recommended. Professor Becker shows us that nationalism and the concept of the sovereign state, imperialism and power politics, cannot be abolished by resolution. They represent actualities with which we must deal. Yet in his last two chapters, the author indicates how—within the framework of reality—it is possible to do the two essential things—to maintain peace, temporarily by force; and to build gradually but steadily toward those economic adjustments which alone can make peace by mutual consent a possibility.

An article by Forrest Davis [4] outlined last spring what the author considered to be the post-war international policy of our Government. It is a policy which has not yet been contradicted by any official acts at Washington, and is a policy in essential accord with that outlined by Becker. It involves essentially two things. First and foremost, the peace must be maintained—in the name of the United Nations and in the interest of all of them—but actually by the air forces and navies and armies of the four powers which alone will have armed forces and industrial resources of overwhelming power. There is no reason to believe that the United States and Russia would for a moment consider the abandonment of those powers in favor of an international police force beyond their effective control. There is good reason to hope that the four Great Powers would be ready to use their forces with intelligence and foresight in the common interest.

Parallel with this temporary expedient should go the creation of a fully-representative and democratic assembly of the United Nations (and ultimately of all nations of good will) for the development of international policies and the direction of technical commissions (dealing with agriculture, currency, trade, health, labor conditions and the like). From such a structure, a more closely-knit world order can be evolved, by trial and error and through the development of national confidence in the machinery developed.

Such a solution satisfies neither the extreme isolationist nor the extreme internationalist. It is the middle way, in accord with the educational principles of "learning by doing." It is the immediate hope of a world where, as ever before—"politics is the art of the possible."

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2. Simon and Schuster, New York, 1944.
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4. *The Saturday Evening Post*, May 20, 1944.

TUBERCULOSIS AS AN ECONOMIC PROBLEM

THE specific cause of tuberculosis is the *Mycobacterium tuberculosis;* but the most common factor associated with this disease is the economic one. Whether tuberculosis is considered from the standpoint of the individual, the family, or the community, the financial factor stands out prominently in the blueprints of cause and effect. Therefore, tuberculosis is both a medical and a social problem. It is as sound public economy to provide the necessary medical—and social—services for the control and prevention of tuberculosis as it is to spend public moneys for a safe water supply, proper sewage disposal, and fire and police protection.

It has been estimated that the average case of tuberculosis represents a community liability of approximately ten thousand dollars. It is a fact that less than 6 per cent of the families in which the disease occurs are financially able to meet this cost. Accordingly, the taxpayer is paying the bill for tuberculosis whether he realizes it or not. And yet, failure to give full recognition to the many economic aspects of the disease, as well as the adoption of short-sighted and pennywise public policies, are unquestionably postponing the time when the real cost involved may be further reduced.

Encouraging progress has been made in the control of tuberculosis by the application of epidemiology and clinical medicine. But the benefits would reach farther and last longer if equally effective measures were adopted to remove the common economic barriers associated with the disease. Failure to recognize these barriers, or failure to do something to ovecome them, results in waste of effort and waste of social resources. The success which has crowned the efforts to eradicate tuberculosis in cattle has been due largely to the recognition that fundamentally it is an economic problem, to be overcome only by the intelligent expenditure of public funds. Sufficient public moneys should similarly be provided and expended within the framework of democratic processes to meet the individual and family needs in overcoming human tuberculosis.

It is wishful thinking to conclude that the optimum in health protection is being realized from the more than one hundred million dollars invested in public tuberculosis hospitals in the United States and from the millions spent annually for their operation, and for case finding. All too frequently the application of the "means test"—the question of ability to pay—does more than any other circumstance to limit the benefits which should accrue from these expenditures. Patients who accept segregation and treatment in a tuberculosis hospital are acting in the public interest. Except in the case of the very few who are well able to pay for their care, family resources for the essentials of healthful environment should be conserved and no payment should be required. The recent elimination by New York State of all requirements for a financial investigation in the case of patients admitted to county tuberculosis hospitals is an admirable step. Where such a policy is in force we have a situation almost unique in the field of American medicine—the provision of what is essentially the best available medical care in one special field for all citizens of the community.

The greatest profit to the individual, the family, and the community results from the discovery and treatment of the disease in its early stage. The x-ray is essential for early diagnosis, and x-ray facilities must therefore be made readily and universally available for all individuals as an element of a progressive public

case-finding service. From an epidemiological viewpoint it may be just as important to know who does not have tuberculosis as it is to know who has the disease. Consequently, the profit from the liberal use of the x-ray should not be expressed only in terms of cases diagnosed.

Equally fundamental in tuberculosis, and even more commonly ignored or neglected, are the related environmental conditions which contribute to the spread and development of the disease. Of particular importance is the problem of housing. Insufficient emphasis is customarily placed on the need for more healthful living conditions, particularly for families in which there has been tuberculosis. Many families who are financially able to meet the cost of acute illness become impoverished in the face of this disease.

Poverty or the fear of poverty, more than any other single factor, changes the tides of battle in favor of the tubercle bacillus in the individual or the family. Poverty engenders crowding, ignorance, nutritional deficiencies, and medical neglect, all of which create a favorable soil for the tubercle bacillus. The result is that benign infections become malignant, closed or sputum-negative cases become open or sputum-positive cases, the spread of germs becomes constant and massive, and cases multiply.

The essentials of tuberculosis control are early discovery and prompt and adequate treatment and segregation. Anything which prevents the attainment of these objectives impedes progress in controlling the disease. The economic factor is such an obstacle. It is common; it is often serious; it has a profound influence on the development and management of tuberculosis.

The needs are clear. There must be wider and keener recognition of the existence of this barrier to progress, and there must be courageous leadership in the execution of steps for its removal.

New Developments in Health Education*

Public Health Education Section

IN preparing this report the committee did not undertake a detailed survey of our field. It sent out no questionnaires. Instead it relied on informal inquiry addressed to a few people in various parts of the country who presumably would know about outstanding new developments. By this method and while all attention is focused on the war it is not unlikely that many important new things have escaped our attention.

NATIONAL DEVELOPMENTS IN THE UNITED STATES

At the national level one of the most significant developments is the expanded interest of the U. S. Public Health Service. An experimental in-service program conducted for its own employees in Washington has brought it the added responsibility of directing a health education program for all government employees, under Congressional authorization. Stimulated by its leadership many local health departments have begun training of health education personnel and have sponsored courses, workshops, and scholarships in health education for teachers.

During the last two years the Service has directed demonstrations in 90 southern areas on the use of teachers during the summer months for community education for malaria control. The rapidly widening program of education of food handlers pioneered by Texas has received increased impetus through the appointment by the Service of eight individuals to carry on this program in its regional districts.

Perhaps the greatest new development in health education, measured in terms of dollars spent and people reached, has been in the field of nutrition. Under the leadership first of the Office of Defense Health and Welfare Services and later the Food Distribution Administration, the nutrition program has had the participation of many government offices, state and local official, and unofficial agencies and commercial organizations. There must be few people in the United States upon whom its educational message has not impinged. Incidentally, this program also has set an interesting pattern for the utilization of the vast resources of business for health education under government direction.

Another war-born federal activity is the Physical Fitness Program under the leadership of the Federal Security Agency in coöperation with other federal agencies.

A program that has great implications for the future is that of the Federal Public Housing Authority. This agency has appointed a Director of Health Education and is urging its Project Service Advisers to assist with the development of health education programs in the housing projects.

The committee has not attempted to review the extensive programs of the Army, Navy, Office of War Information, Office of Foreign Relief and Rehabilitation Administration, and other

* COMMITTEE ON NEW DEVELOPMENTS IN HEALTH EDUCATION Organized 1942.

wartime agencies. It should be noted here, however, that as a result of the work of these agencies millions whom our health education efforts have only lightly touched in the past are now being reached with health education through newspapers, periodicals, pamphlets, movies, radio, and in classes all over the world.

Among the national voluntary agencies an outstanding development is the study by the National Health Council which is nearing completion. This study reached into many communities and its report should have a wide effect in sensitizing the country to the needs and opportunities for health education.

During the past year or two the contributions of business and industry have noticeably increased, particularly in the field of nutrition education.

Under new direction the National Safety Council and its local affiliates have stepped up programs on safety education, aided by industry, the War Production Board, and other government agencies, and special projects, such as the unique Safety Zone Program of the Zurich Insurance Companies.

STATE PROGRAMS

Several interesting developments have occurred in the states. Florida and Illinois have created large autonomous state-wide Public Health Committees. Nebraska and Pennsylvania and Utah have set up local Health Assemblies. California has sponsored local Health Institutes. Illinois, Indiana, Oklahoma, and North and South Carolina, among others, have initiated programs of training health education personnel for their health departments. Other states in other ways give evidence of increased appreciation of the necessity for health education under trained direction in any well rounded public health program.

LOCAL PROGRAMS

Of far reaching importance is the growing movement for organized citizen interest in community health activities. Sometimes stimulated from above, but frequently arising from forces within the community, this stirring at the grass roots gives great hope for a wide support of all health actvities in the future. Noteworthy developments have occurred in Boston, New York, Hartford, Bridgeport, Detroit, and in local areas in North Carolina, South Carolina, and Oklahoma.

MATERIALS

Out of these many programs and others there has come a wealth of new materials for our use, much of it better than ever before. Leaflets, pamphlets, exhibits, radio scripts and, in a few instances, films are being designed for particular groups using appeals to reach people in new kinds of work, new communities, new conditions of marketing, budgeting, and living. A healthy sign in a time of strain is the somewhat more frequent use of humor, a useful but sometimes dangerous tool. There is evidence of increasing collaboration among interested groups in the preparation of materials, such as that between health and mental hygiene workers, and between tuberculosis workers and public health nurses. There is also more emphasis on securing editorial help from mothers and others for whose use materials are being planned.

Key sources of new material are:

The Cleveland Health Museum for exhibits

The U. S. Public Health Service, particularly for posters and pamphlets

The U. S. Department of Agriculture, regional offices of the *Food Distribution Administration* and state and local *Nutrition Committees* for a wide variety of nutrition materials including lists of additional sources

The U. S. Office of Education for publications on the Physical Fitness Program prepared in coöperation with the Army, Navy, U. S.

Public Health Service, and the Office of Community War Services

The U. S. Children's Bureau for information on the free Emergency Maternity and Infant Care Program for wives and babies of enlisted men

The U. S. Department of Labor and the *National Safety Council* for materials on Safety in the Home, on the Farm and on the Job

The Planned Parenthood Federation of America for materials on family planning in relation to public health

The American Film Center for a new and excellent annotated list of health films for lay audiences

For other references to materials, books, and programs, Section members are referred to the monthly "Credit Lines" in the *American Journal of Public Health*, and *Channels*, published by the National Publicity Council. Among the important new books are Dr. Nyswander's *School Health Problems*, the Report from the American Museum of Health on "What the Public Knows About Health," and the American Association of School Administrators' *Health in Schools*.

A dramatic expression of the reawakened interest in health exhibits is the "Healthmobile" of the Brooklyn Tuberculosis and Health Association which is on display at this meeting.

PERSONNEL TRAINING

Keeping pace with the expanding horizons of health education, colleges and universities have accelerated and modified their educational programs. As a background they now have available the "Proposed Report on the Educational Qualifications of Health Educators."* This stresses the importance of field experience and "internship" and mentions the place for graduate training. Although most schools have always offered some "field work" as part of their training in health education, the actual development of special field training courses originated as part of the health education program which began in September, 1941, when the U. S. Public Health Service in coöperation with the North Carolina State Board of Health launched the first of a series of demonstrations in community health education in war counties. To meet the demand for personnel which these demonstrations created, fellowships were provided by several state health departments and the W. K. Kellogg Foundation to send trainees for graduate work to the School of Public Health at the University of North Carolina beginning in March, 1943.

A second grant to the U. S. Public Health Service from the W. K. Kellogg Foundation has made it possible for Yale and the University of Michigan also to offer this broader training in health education. Grants for health education fellowships have also been offered by the Commonwealth Fund and the Institute of Inter-American Affairs.

In connection with grants from the latter organization the newly created School of Public Health at the University of California plans to offer a special course in Health Education to meet the needs of Latin Americans. Meantime it is to be regretted that the Health Education course at the Massachusetts Institute of Technology which has trained so many of our leading health educators will be discontinued next year.

DEVELOPMENTS IN CANADA

The Health League of Canada reports that it has initiated this year a National Immunization Week with large-scale sponsored advertising, poster distribution, and nation-wide radio hook-ups. It has also embarked on an extensive Industrial Hygiene program in coöperation with Canadian Industries. In the Province of Quebec it has sponsored a campaign for a province-wide pasteurization law.

* *A.J.P.H.*, 33, 8:998 (Aug.), 1943.

FOREIGN DEVELOPMENTS

In the Office of the Coördinator of Inter-American Affairs there have been established sections both on Health Education and School Health Education, and a program for Latin America, embracing training in this country and in Latin America, demonstrations and health education activities is now under way from that Office. In connection with these programs there was held on October 11 what may prove to be only the first of a series of Inter-American Conferences on Health Education.

From England there has arrived this year the first issue of a new quarterly *Health Education Journal*, published by the Central Council for Health Education, which it is interesting to note provided the weekly periodical *Index of the National Health Library* with a full column of material on health education for the first time in its history.

SUMMARY

These brief highlights demonstrate unmistakably that health education is a lusty adolescent which is earning and receiving a larger place in the family of public health specialties. It is clear, too, that the war has emphasized the need for health education and has given it means to expand.

Some of the governmental agencies responsible for post-war planning have requested plans for an adequate health education program after the war. It might be well for the Section to appoint a committee to work on such plans now and thus make available the experience of the profession for any plans that may be devised.

The committee regrets that there is not time to describe in some detail many of the various programs, projects, courses and materials which have been referred to, or to mention the splendid continuing programs of the scores of national and local official and voluntary agencies. It was frequently difficult to decide whether or not a development was "new." Being under a mandate from the Section to keep our report short, we have no doubt erred in the direction of omission. There must be many whose important contributions have been neglected in this brief compendium of new highlights. The committee asks their indulgence in view of Annual Meeting program limitations. Recommended additions to the report will be welcome.

The committee acknowledges the valuable contributions it has had from Drs. Coffey, Derryberry, Horning, Platt, Bauer, and Bates, and Mrs. Walsh and others in compiling its material.

HOMER N. CALVER, *Chairman*
LUCY S. MORGAN, PH.D.
KATHERINE Z. W. WHIPPLE

Report of the Archivist, 1943

Laboratory Section

NOTICE of honors and awards to members of the Section have appeared frequently in the literature during the year. Dr. John R. Mohler, Chief of the U. S. Bureau of Animal Industry, retired after twenty-six years' service. He has been awarded many honorary degrees and prizes during this time; the most recent, the Alumni Reward of Merit at the Founders' Day ceremonies on January 16 at the University of Pennsylvania.[1]

Charter and early members of the Section continue to be nominated for their distinctive services. Dr. Samuel Gate Prescott was awarded the Nicholas Appert Medal by the Institute of Food Technologists for his valuable contributions in the field of food technology, especially to the progressive development of food manufacture and processing. Since his retirement in June, 1943, as Dean of Science of the Massachusetts Institute of Technology, he has been called into consulting service by the Dehydration Committee of the U. S. Department of Agriculture.[2]

Brigadier General Frederick F. Russell, retired, was awarded the recently created Gorgas Medal for "exceptional meritorious service to preventive medicine for our armed forces," by the Association of Military Surgeons of the United States on December 15, 1942.[3]

The Maritime Commission has honored the small group of medical men who in earlier years made Johns Hopkins University famous throughout the world, by giving their names to new Liberty ships.[4] Dr. Welch's services are memorialized in the ship "William Welch."

The death of the following members and fellows is recorded with deep regret:

Frank C. Rainier
Whittier, Calif.
Elected Member 1940

James M. Brannon, Ph.D.
Urbana, Ill.
Elected Member 1929

Clarence N. Boynton
Phoenix, Ariz.
Elected Member 1916. Elected Fellow 1935

Charles R. Hoover, Ph.D.
Middletown, Conn.
Elected Member 1930

During the year the 1,018 members of the Laboratory Section were canvassed so that there might be as complete a record as it is possible to make at this time of the services and activities of the individuals and the Section in relation to the war. The 358 replies indicate the solid contributions of the laboratory to the medical and public health problems of the war period and to the educational and post-war situations.

The replies were examined by groups, that is, those from members in the universities and research institutes, in governmental service—from federal to municipal organizations — commercial and private laboratories, hospitals, and the Army or Navy, either in regular service, or under enlistment for the present war.

Enumeration of services and activities could have no statistical value, since the returns are not complete nor, as was expected, has it always been possible to state the specific project under investigation. These records do show, however, how extensively estab-

lished laboratory services have been utilized and that competent investigators are making important contributions to the varied and urgent practical needs of the war.

The greatest number of replies (83) is from the university-research-institute group. The number of projects directly related to the war is also highest in this group. Members are serving on the committees for the Investigation of Epidemic Disease of the Army and are consultants to the Secretary of War and to the U. S. Public Health Service. Under the Committee on Medical Research of the Office of Scientific Research and Development they are also engaged as Consulting Investigators or Responsible Investigators on specified and unspecified projects. Others are in active military service, frequently in highly responsible positions. The special war research projects at the universities are in practically all instances added to accelerated teaching schedules. In several instances the colleges have collaborated as units of the Army or Navy.

Twenty-three replies were received from members of the Section in government laboratories in the United States, Alaska, Hawaii, Canada, Jamaica, Mexico, and Puerto Rico. The variety and range of responsibilities and undertakings make this group alone a miniature American Public Health Association.

The official health departments of only 25 states and 3 Canadian provinces are represented in the replies to the canvass; but 62 replies were received from these 25 states. The flexibility of organization and the personal contributions that have made it possible to assume much added work, while at the same time there has been a serious loss in trained personnel, appear in this group. Members of the state and provincial laboratories are also among the consultants to the War Department, and they collaborate with the Area Service Command Laboratories by instructing medical personnel in laboratory procedures. State gas officers and gas consultants have also been selected from the staffs of the state laboratories.

Reports from members in 49 county and city laboratories in the United States and Canada, like those in state and provincial laboratories, show them to be carrying heavily increased schedules in all services. While members in the federal and state laboratories are seen from their reports to be engaged in policy-making and administrative phases of war work, those in the smaller local units participate immediately in the medical, public health, and sanitary problems of civilian protection and education. Members in the large city laboratories, however, are also represented in the national consultantships and war agencies.

The demands on maintenance and operation that are made on the outlying laboratories are illustrated in a reply from the Branch Laboratory at Anchorage, Alaska. The acting director reported the "designing and equipping of a two-unit portable laboratory for use in epidemiological field work; the laboratory can function away from any base for one month and has supplies for handling 400 contacts. The whole weight of 2 units is 200 pounds; both are designed for easy handling and rapid transportation."

The 54 replies from commercial and private laboratories record important and extensive research and service both in civilian and war needs, in medical, veterinary and agricultural projects, in dairy research, chemical warfare, and industrial hygiene.

Thirty-three replies from members with hospital affiliation list active participation in civilian medical service, blood donor service, and important research by Responsible Investigators under the Committee on Medical Re-

search of the Office of Scientific Research and Development.

Forty-two replies show only present Army or Navy affiliations, but they list the responsibilities that are associated with titles ranging from that of Assistant Medical Technician to Brigadier General.

The canvass has thus produced for the archives a record of the activities in this war period of more than one-third of the membership of the Section. The pattern of medical and health services to the nation is interestingly shown in the responses from members in all grades of government and hospital service. Valuable contributions have also come from their researches. Private laboratory enterprises are seen to augment the government organizations in a remarkable way. Members in universities and research institutes show significant contributions in a splendidly coördinated plan of investigation, which has a counterpart in the practical applications made under the direction of the Army and the Navy.

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2. *Science*, 97:396, 1943.
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4. *J.A.M.A.*, 121:1358, 1943.

AUGUSTUS B. WADSWORTH, M.D.

Examination of Water and Sewage*

Laboratory Section

THE following changes in bacteriological analysis of water, by the Standard Methods Committee on the Examination of Water and Sewage, which have been made in manuscript are submitted for your consideration:

1. The introduction of medium formulae for tryptone glucose extract agar and lauryl sulfate tryptose agar. The elimination of formulae for crystal violet lactose broth and fuchsin broth.

2. The introduction of methods for treating sample bottles with sodium thiosulfate and recommendation that chlorinated waters be collected in thiosulfate-treated bottles.

3. The introduction of tryptone glucose agar as an alternative to nutrient agar for plating water samples.

4. The term "coliform" be used to replace "coli-aerogenes" throughout the text.

5. The introduction of the following paragraph concerning media for the presumptive test:

"In these standard tests lauryl sulfate tryptose broth may be substituted for lactose broth in the examination of all waters except final filtered, treated and filter-treated waters. It may be substituted for lactose broth also in the examination of final, filtered, treated and filtered-treated waters provided the laboratory worker has amply demonstrated by correlation of positive completed tests (isolation of coliform organisms) secured through the use of lauryl sulfate tryptose broth with those secured through the use of lactose broth, in the examination of such waters, that the substitution results in no reduction from the density of coliform organisms indicated by the standard procedure using lactose broth."

6. Brilliant green lactose bile broth is the only liquid confirmation recognized. Fuchsin lactose broth, crystal violet lactose broth and formate-ricinoleate broth have been dropped as confirmatory media. Formate-ricinoleate broth can still be used in the completed test for detecting spore-forming bacilli.

The incubation period for brilliant green bile broth shall be 48 ± 3 hours at 35°–37° C.

W. L. MALLMANN, PH.D.,
Chairman
MAC H. MCCRADY
A. M. BUSWELL, PH.D.
F. WELLINGTON GILCREAS
LELAND W. PARR, PH.D.
THEODORE A. OLSON
M. STARR NICHOLS, PH.D.
JOHN T. TRIPP, PH.D.

* Report of the Standard Methods Committee.

STANDARD METHODS COMMITTEE ON EXAMINATION OF WATER AND SEWAGE
Organized 1899. Reorganized 1933. Published reports: *Year Books* 1930–1931, 1934–1935, 1935–1936, 1937–1938, 1939–1940, 1941–1942, *A.J.P.H.*, May, 1943. 8 volumes published: 1905, 1912, 1917, 1920, 1923, 1925, 1933, 1936.

Examination of Germicides and Antibacterial Agents*

Laboratory Section

THE Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents comprises separate progress reports from the several Referees and Associate Referees.

STUART MUDD, M.D., *Chairman*

* Committee authorized 1941. First published Report *A.J.P.H.*, 33, 5:602 (May), 1943

Antibiotic Agents

Considerable progress has been made during the year on the formation, nature, and utilization of antibiotic substances produced by microörganisms. Some of the more significant results can be summarized as follows:

Penicillin, the most important antibiotic agent so far isolated, is now being produced in this country by 15 to 20 industrial organizations. The material can be used very effectively in the treatment of pneumococcus, streptococcus, and staphylococcus infections, some of which are resistant to the action of the sulfonamides. Progress has been made not only in the mass production of the penicillin, but also in our knowledge of its chemical nature and in its mode of action. Tyrothricin, produced by *Bacillus brevis*, has found extensive use in the treatment of mastitis in cattle, and in topical application in certain human infections.

Several new antibiotic agents have been isolated recently. *Penicillium notatum* was found to produce, in addition to penicillin, another factor, designated as *Escherichia coli* factor, penatin, notatin, and penicillin B. This is an oxidative enzyme, protein in nature, and active in the presence of glucose; its activity is neutralized by catalase. *Aspergillus flavus* was shown to produce two active substances: (a) aspergillic acid, that acts against both Gram-positive and Gram-negative bacteria, and (b) flavicidin, similar in every respect to penicillin. Streptothricin, produced by *Actinomyces lavendulae*, is a basic substance; it possesses limited toxicity and is active against Gram-negative as well as Gram-positive bacteria. Proactinomycin, isolated from *Proactinomyces gardneri*, is also a base, but it is active largely against Gram-positive bacteria.

Among the other substances recently isolated from microörganisms, it is sufficient to mention clavacin, fumigacin, claviformin, and penicidin. They differ in toxicity to animals and in their activity, some being active largely against Gram-positive bacteria, and others are active both against Gram-positive and Gram-negative bacteria. Very little is known concerning their chemical nature.

SELMAN A. WAKSMAN,
Associate Referee

Chemical Antiseptics

For the development of methods for testing antiseptics, associate referees have been appointed who are currently at work on various phases of the methods for testing antiseptics. The preliminary work that is now under way concerns the development of a medium for use in *in vitro* testing of antiseptic substances. This investigation is directed toward the development of a medium which will give constant results in the hands of different laboratory workers, particularly in the control of the resistance of the organisms to be used in the test.

Work is also under way on a study of the resistance of different types of organisms which are being considered for use in *in vitro* tests. It is contemplated that eventually in such tests we will utilize not only staphylococci, but possibly streptococci, coliform, and pseudomonas types as well. Through study of the resistance of different species of organisms it will be possible to bring out more clearly the inherent specificity of most germicidal compounds.

The *in vitro* testing of antiseptics is only a preliminary step in determining their efficacy, since the clinician is mainly interested in what an antiseptic is capable of doing under the actual conditions of use. Investigations are planned which will give us methods for determining the efficacy of germicides under the conditions of use in or on the human body. Such tests will include toxicity tests, both *in vitro* and *in vivo*, with the thought in mind that the value of the *in vitro* test lies mainly in its ability to eliminate the inefficient antiseptics, and the true worth of an antiseptic is only elicited through a study of it as near the actual conditions of use as it is possible to obtain.

Investigations are planned to include a study of the efficacy of germicides in the destruction of spores, particularly of the genus *Clostridium*, as they relate to those preparations offered for use for cold sterilization of surgical instruments. In connection with this, it should be pointed out that the referees involved in the investigations dealing with antiseptics and disinfectants plan to work closely together since the study of antiseptics, disinfectants, and fungicidal substances are so closely interrelated.

The associate referees on antiseptics met during these sessions to discuss plans for the investigations to be carried out during the coming year.

HENRY WELCH, *Referee*

Chemical Disinfectants

Restrictions on allotments of phenol and cresol for use as disinfectants have led, during the past year, to very great increases in the relative and gross amounts of synthetic preparations now being offered as disinfectants.

At the St. Louis meeting of this Association, a paper was read pointing out that in the case both of certain synthetic disinfectants and the more familiar coal-tar type, containing synthetic wetting agents, the conventional phenol-coefficient method of evaluating germicidal power may give widely divergent and deceptive results. During the year expressions of dissatisfaction with the F.D.A. phenol-coefficient method as a test for modern disinfectants have been received from several sources.

In the face of this urgent situation a subcommittee on disinfectants has been formed to study means of improving germicidal tests for these compounds.

Members of the subcommittee have been selected from a wide field and represent the manufacturers, the commercial examiners, academic, and government control interests in the problem.

Difficulties in the present procedure arise from the fact that the sensitivity of the test organisms, *Eberthella typhosa,* to certain germicidal substances is altered when it is cultured in media containing peptone of slightly different composition. The effect is not detectable by the organisms' reaction to phenol, i.e., by the phenol control. Other microörganisms such as *Pseudomonas aeruginosa* and *Escherichia coli* are relatively insensitive to these variations in the peptone. Three distinct approaches to the problem have been recognized as corrective possibilities and investigation on the three has been initiated. Dr. Mallmann of Michigan State College has instigated an endeavor to obtain a less unstable if not a constant strain of *Eberthella typhosa* or closely related organism suitable for use. Work on the resistance of a number of strains of *Pseudomonas aeruginosa* and *Escherichia coli* which might be used for testing purposes was commenced during the year. Efforts to locate a source of peptone of constant composition suitable for the culture medium have been under way for some time.

Information from the newly appointed associate referees indicates that the subcommittee is anxious to accomplish the work necessary to recommend improvements in the present testing procedure; and I feel that it may be in a position to do this within the forthcoming year.

C. M. BREWER, *Referee*

Detergents

The development of cationic and anionic wetting agents with germicidal or bacteriostatic properties opens a new field of application for detergents. There have appeared on the market a number of detergent-sanitizers in the past that upon investigation were found to be wanting both as good detergents and as sanitizers. To date the writer, upon investigating the claims of these products, has been unable to justify their uses. Several cationic compounds when mixed with detergent mixture offer marked possibilities as detergent-sanitizers that have practical applications. The writer expects to spend considerable time in the development of such products during the coming year. The past year the writer has been doing exploratory work on detergent-sanitizers and their practical usefulness.

W. L. MALLMANN, *Referee*

Disinfection of Air by Germicidal Vapors and Mists

Recent developments in the field of air sterilization with glycol vapors have shown that triethylene glycol is the most potent bactericidal and viricidal agent yet found.[1] This substance is highly lethal in concentrations of 1 gm. of the glycol dispersed in 200 million ml. or more of air for the respiratory pathogens and influenza virus. Toxicity tests on triethylene glycol consisting of maintaining monkeys and rats for many months to a year in an atmosphere saturated with this substance have revealed no deleterious

effects. Likewise the long continued ingestion of this substance has had no detectable harmful action.

Investigation of the various conditions which affect the germicidal activity of glycol vapors has shown that atmospheric humidity is of marked importance; a minimum of 35 per cent relative humidity being essential for the killing of dust-borne bacteria.[2] Practical application of the use of glycol vapors for the purpose of controlling air-borne infection has had to await the construction of suitable apparatus for the dispersion of glycol vapors into large enclosed spaces and the development of an instrument to control automatically the concentration of glycol vapor in the air. Rapid progress is being made in the solution of both these problems. Reports of the use of propylene glycol vapor in a children's hospital suggest that it was effective in reducing the incidence of acute respiratory infections.[3]

1. Robertson, O. H., Puck, T. T., Lemon, Henry M., and Loosli, C. G. *Science*, 97:142, 1943.
2. Lecture before Harvey Society, Apr. 15, 1943.
3. Harris, T. N., and Stokes, Joseph, Jr. *Am. J. Med. Sci.*, 204:430, 1942; 206:631, 1943.

O. H. ROBERTSON, *Associate Referee*

Disinfection of Air by Ultra-violet Irradiation

A number of publications have appeared on the usefulness of upper air irradiation in the control of cross-infection in children's hospitals and infant wards. It appears that the use of ultra-violet irradiation of operating rooms and nurseries is now well established.

No publications are available on the application of ultra-violet irradiation in the control of air-borne infection in sleeping quarters. Such information is urgently needed since the crowding of men in large sleeping halls may require a quick decision on the possible use of ultra-violet irradiation in stopping cross-infection in military establishments.

Recent publications have again emphasized the importance of dust and lint as possible carriers of micro-organisms. Upper air irradiation would destroy only microörganisms and virus particles which come into the range of intense radiation. The use of floor irradiation has been suggested. The installation of fixtures for floor irradiation appears to be a relatively safe procedure since in general many floors have low reflecting power for ultra-violet radiation.

A new acceptance of ultra-violet irradiation for the purposes of disinfecting air has been published by the Council on Physical Therapy of the American Medical Association (*J.A.M.A.*, 122: 503–504, 1943). It is important to point out that anyone who is planning to install ultra-violet sources for air irradiation should study this acceptance most carefully.

ALEXANDER HOLLAENDER,
Associate Referee

Fungicidal and Fungistatic Agents

The Subcommittee on Fungicides is engaged in a critical examination of methods now used in fungicide testing. Comparative studies so far made have suggested that some of the technics in use should be modified but the subcommittee is not yet ready to recommend specific changes.

TEST ORGANISM

It has been found that a fungus carried under the name "*Trichophyton rosaceum*" and widely used as a test organism is actually a species of *Fusarium*. This is a saprophytic fungus unrelated to dermatophytosis. Attempts so far made to obtain an authentic culture of *Trichophyton rosaceum* have failed and it is concluded that the name has been incorrectly used in the reports of fungicide testing. The dermatophyte correctly designated *T. rosaceum* is, in any case, unsuitable for use as a test fungus because of its slow growth and sparse sporulation.

The selection of one or more fungi to be used as standard test organisms will require further comparative studies. So long as the fungicides to be tested are intended primarily for use against dermatophytosis, it is reasonable to select a dermatophyte. Of the three important genera of dermatophytes, *Trichophyton* is most important in the etiology of dermatophytosis of the foot and is also most suitable for use as a test fungus. The strain of *Trichophyton* selected should be stable, produce many conidia (spores), produce conidia of only one type (unicellular and of uniform size), allow preparation of a uniform suspension without clumping and without formation of surface films, and have a satisfactory resistance to heat or a standard fungicide. Many strains of dermatophytes will not meet these requirements. The strain chosen should be accurately described in terms of colony appearance, morphology, and resistance so that another strain can be substituted if the original is lost or becomes unsuitable for use. Stability in the dermatophytes is only relative. Any strain chosen will quickly and certainly mutate to produce an inferior strain unless it is frequently transferred and refrigerated between transfers.

TECHNICS

Specific problems of technic now being investigated include: the medium to be used, the selection of a suitable peptone, the relative advantages of liquid and agar media for production of conidia, methods of preparing a conidial suspension, proper density of conidial suspension, intervals of exposure, methods of withdrawal of sample, best type of medium for subculture of exposed sample, and selection of a suitable fungicide for standard comparison.

C. W. EMMONS, *Associate Referee*

Stillbirth and Maternal Mortality Rates*

Vital Statistics Section

THE Subcommittee on Maternal, Stillbirth and Infant Mortality has been set up to consider "the best method of computing Maternal Mortality . . . problems of stillbirth registration and the best method of stating the rate." †

This preliminary report is limited to general considerations of the stillbirth rate and to one method of supplementing the maternal mortality rate. The broader aspects of the problem of stillbirth registration and of the different kinds of measures for maternal mortality require more extensive and elaborate investigations, which the subcommittee hopes to continue.

STILLBIRTHS

Definition—The Model Vital Statistics Act ‡ recommends the following definition: "Stillbirth means a birth after at least twenty weeks of gestation in which the child shows no evidence of life after complete birth." "Evidence of Life" is further defined as follows: "The words 'Evidence of life' include heart action, breathing, or movement of voluntary muscle." The laws of only one-half of the states are in complete agreement with the above definition. The laws of the other half of the states and of the District of Columbia differ from the above definition in one or the other of the two criteria. Nine of the states are not in accord with the Model Act in the definition of "evidence of life." Fourteen states and the District of Columbia differ from the Model Act in their requirements of the minimum period of gestation. One state is not in accord with the Model Act in either of the two criteria.

The minimum period of gestation at which registration of stillbirths is required is the more important of the two criteria in terms of the inequality of stillbirth registration in the different states. In 3 states and in New York City the minimum period of gestation required for stillbirth registration is less than 20 weeks. Five states require registration only if the fetus is advanced at least to 28 weeks of gestation. In the remainder of the states which are not in accord with the Model Vital Statistics Act, the period varies between 20 and 28 weeks.

It is to be expected that the differences in the definition of stillbirths are directly related to the relative number of stillbirths that are registered in the different states. For example, the stillbirth rate in 1940 varied from 16.4 per 1,000 total births in the State of Washington (requirement for registration—"advanced beyond the seventh month") to 49.4 in New York State (New York City requires the registration of all products of conception).

Because of this inequality in stillbirth registration, the Bureau of the Census restricts the amount of detail which it tabulates from the stillbirth certificates. It is also primarily for this reason that the Bureau of the Census bases the stillbirth rate on live births rather than on total births (live births and stillbirths) on the theory that the ratio of stillbirths to live births

* Report of the Subcommittee on Maternal, Stillbirth and Infant Mortality, of the Committee on Statistical Practice, organized in 1941.

† *A.P.H.A. Yearbook*, 1941–1942, pp. 177–178.

‡ Model Vital Statistics Act—Department of Commerce, Bureau of the Census, Washington, D. C., Mar., 1941.

NEONATAL MORTALITY AND STILLBIRTH RATES, BY STATES, AND THE MINIMUM PERIOD OF GESTATION REQUIRED FOR STILLBIRTH REGISTRATION, 1940

State	Minimum Period of Gestation	Neonatal Deaths per 1,000 Live Births	Stillbirths per 1,000 Total Births (Including Stillbirths)
Total (All States)		28.8	30.3
Minimum period of gestation in accord with Model Vital Statistics Act (At least 20 weeks)			
Total (32 States)		29.5	29.0
Alabama	Advanced to 5th month	36.7	38.4
Arizona	Advanced to 5th month	35.6	24.2
Arkansas	5th month	23.5	23.4
California	Advanced to 5th month	25.4	19.2
Colorado	5 months (20 weeks) or more	33.2	23.4
Delaware	5 months	26.8	23.4
Florida	Advanced to 5th month	33.6	40.5
Georgia	Advanced to 5th month	35.1	45.5
Illinois	Advanced to 5th month	24.1	24.9
Iowa	Advanced to 5th month	25.1	22.0
Kansas	Passed 20th week	24.1	24.1
Louisiana	5 months (20 weeks) or more	36.7	36.6
Maine	5 months or more	34.6	28.5
Michigan	Advanced to 5th month	26.5	25.3
Minnesota	Advanced to 5th month	23.4	21.0
Mississippi	5 months	30.7	46.0
Missouri	5 months	28.0	31.4
Nebraska	Advanced to 5th month	24.0	22.6
Nevada	After at least 20 weeks	30.6	18.6
North Carolina	Advanced to 5th month	33.4	33.3
North Dakota	5 months	29.1	21.8
Oklahoma	Advanced to 5th month	29.5	24.6
Oregon	After at Least 20 weeks	23.1	20.7
South Dakota	Advanced to 5th month	27.6	18.4
Tennessee	5 or more months	30.2	28.3
Texas	Advanced to 5th month	34.2	30.5
Utah	Advanced to 5th month	27.8	18.3
Vermont	5 months or over	30.6	25.2
Virginia	5 months (20 weeks) or more	34.9	35.5
West Virginia	Advanced to 5th month	31.4	34.2
Wisconsin	5th month	25.3	21.5
Wyoming	After at least 20 weeks	26.1	19.6
Minimum period of gestation less than 20 weeks			
Total (4 States)		26.9	36.6
Maryland	Any recognizable product	28.8	41.8
New York [1]	New York City—every product of conception	25.4	49.4
Ohio	At least 4½ months	26.9	25.2
Pennsylvania	4 months	28.4	27.8
Minimum period of gestation more than 20 weeks			
Total (13 States)		28.5	26.9
Connecticut	After not less than 28 weeks	25.0	19.8
District of Columbia	Passed 5th month	33.0	25.0
Idaho	Development sufficient to give chance of life	26.7	21.1
Indiana	7 months and over	26.3	22.4
Kentucky	5½ months	32.2	31.0
Massachusetts	After 5 months	25.3	26.1
Montana	6 months or 24 weeks	29.8	18.4
New Hampshire	28 weeks	24.3	24.7
New Jersey	Advanced beyond 5th month	24.2	25.4
New Mexico	5½ months	41.6	27.5
Rhode Island	6 completed months	26.2	27.5
South Carolina	22 weeks	36.5	45.0
Washington	Advanced beyond 7th month	24.6	16.4

[1] The law for New York State (Exclusive of New York City) is in accord with the Model Vital Statistics Act.

does not convey the impression of a rate which presumably measures risk.

It is difficult to evaluate the differences in the stillbirth rates of the various states in order to determine whether these differences are real and to what extent they are the results of the inequalities in the definition of stillbirth. The committee attempted to obtain at least a partial answer to this question by comparing the stillbirth rates of the various states with the neonatal mortality rates (see table). These two rates are influenced by the same general group of congenital and environmental factors. It may therefore, be expected that, by and large, the variations of the stillbirth rate in the different states would be similar to those of the neonatal mortality rate. A large excess in the variation of the stillbirth rate over that of the neonatal mortality rate would indicate the effect on the stillbirth rate of the inequalities in the provisions for the registration of stillbirths in the different states. Indeed, it is seen that generally the stillbirth rate is larger in those states in which the required period of gestation is smaller. For example, for the group of 32 states whose laws are in accord with the Vital Statistics Act the stillbirth rate is practically the same as the neonatal mortality rate; for the 4 states in which the minimum period of gestation is less than 20 weeks, the stillbirth rate is considerably higher than the neonatal mortality rate, and for the 13 states which require the registration of stillbirths only at periods of gestation of more than 20 weeks, the stillbirth rate is lower than the neonatal mortality rate. However, a comparison in the individual states between the neonatal mortality and the stillbirth rates reveals that the differences are almost as large among the 32 states which are in accord with the Model Vital Statistics Act, as among the remaining states. Moreover, with the exception of a few states which require the registration of all products of conception, the total range of variation of the stillbirth rate by state is not much different from that of the neonatal mortality rate.

The conclusion that may be drawn from this table is: (1) that we are approaching relative uniformity in the registration of stillbirths, and (2) that a large part of the inequality existing in stillbirth statistics is the result of the different legal requirements for registration. This latter may to a large extent be eliminated by different procedures in the tabulation of stillbirths.

Improvement in the comparability of stillbirth statistics in the various states may be accomplished even before all the states attain uniformity of definition. For example, only stillbirths stated to be of 20 weeks or more gestation may be included in the stillbirth tabulations. It is also possible to publish two distributions of stillbirths: one to include all those of at least 20 weeks gestation and the other to include only stillbirths of 28 or more weeks of gestation. This latter distribution would not only provide a uniform basis for comparing the stillbirth rate of the different states but would also be useful in computing the maternal mortality rate (see discussion on maternal mortality).

The subcommittee recommends:

1. That states whose laws are not in accord with the Model Vital Statistics Act make every effort to change their laws and regulations to conform with the Model Act with respect to the criteria "evidence of life" and "minimum period of gestation" and thus attain uniformity of definition in all parts of the country;

2. That until such uniformity of definition is attained the Bureau of the Census and the individual states omit from their tabulations all stillbirths stated to be of less than 20 weeks gestation;

3. That the Bureau of the Census experiment with the statement of period of gestation on the stillbirth certificates with a view of publishing an additional distribution, con-

sisting of all stillbirths of 28 weeks or more gestation;

4. That the stillbirth rate published by the Bureau of the Census and by the individual states be based on total births (live births and stillbirths) rather than on live births;

5. That the statistics on stillbirths published by the individual States contain a distribution of the stillbirths by weeks or months of gestation.

MATERNAL MORTALITY

It is common knowledge that the maternal mortality rate is not, in a statistical sense, a rate at all. It does not measure the risk of death associated with the function of reproduction, since the numerator of the fraction, the number of deaths, is much more completely specified than the denominator, the number of women exposed to the risk of dying in this way, because of the incomplete enumeration of abortions. The maternal mortality rate, therefore, always overstates the risk of death associated with the function of reproduction.

If this overstatement were of uniform magnitude in all parts of the country, and under all circumstances, it could be used as a satisfactory substitute. However, it is well known that the frequency of abortions is not uniform throughout the country. For example, it is greater in urban than in rural areas. It may be more frequent in some hospitals than in others. In evaluating public health services the maternal mortality rate is also often misleading because of the inequality in the frequency of abortion cases. For example, nursing home delivery services are restricted to periods of gestation when the offspring is viable. Again in evaluating prenatal clinic services, it must be remembered that a large proportion of the cases make their first contact with the clinic late in pregnancy and consequently are not exposed to the risk of abortion. The mortality experience in such groups cannot be compared to the usual maternal mortality rate; yet it is common practice, for lack of a better index, to use the maternal mortality rate for such purposes.

For a complete discussion of the casualties associated with pregnancy and the puerperium, it would be necessary to have, in addition to complete registration of births and stillbirths, also a detailed account of all abortions that have occurred in a given time. Such registration is of course, not feasible. It should, however, be possible to supplement the maternal mortality rate with another index, which is a fairly adequate measure of the risk of death associated with the delivery of a viable offspring. Such an index is made possible by the 1938 revision of the *International Lists of Causes of Death,* which affords a classification of puerperal deaths in four groups as follows:

1. Those associated with abortions (less than 28 weeks gestation)
2. Deaths resulting from ectopic gestation
3. Those in which death occurred without expulsion of the fetus
4. Deaths which follow the delivery of live or stillbirths (28 weeks or more gestation)

This latter group obviously is directly related to the number of women who were delivered of live or stillbirths. The ratio of deaths following the delivery of a live or a stillbirth to all women who are delivered of live or stillbirths is a measure of the risk of death associated with the delivery of a viable offspring, and is more nearly a measure of the risk of death associated with the function of reproduction than is the maternal mortality rate. It should be a useful index in connection with maternal health problems and form a uniform index suitable for comparison between various localities and different services.

This index could not and should not replace the maternal mortality rate because of the omission of a relatively large proportion of the maternal deaths,

but it can be very useful as a supplement to the maternal mortality rate.

In order to avoid confusion with the term "Maternal Mortality Rate," it has been suggested that the deaths of mothers who were delivered of a live or stillbirth related to all mothers who were delivered of live or stillbirths be referred to as "Puerperal Fatality Rate." This expression, "Puerperal Fatality," appears to have certain advantages. It has the same meaning as the usual "Case Fatality Rate" in the sense that it measures the mortality among a group of people, all of whom were exposed to a given risk. It also parallels the meaning generally applied to a case fatality rate in that it is restricted only to the length of time in which the condition or risk exists, whereas a mortality rate implies the risk of dying from any condition within a specified period of time usually expressed on the basis of a year.

There is an unfortunate discrepancy in the official definitions of abortion. The Model Vital Statistics Act as stated above, defines "stillbirth" as that of a birth after at least 20 weeks of gestation, which implies that all births of dead fetuses of 20 weeks or more gestation are stillbirths and those of less than 20 weeks gestation are abortions. In the classification of maternal deaths, on the other hand, the definition of abortion is given as of less than 28 weeks of gestation. Consequently all stillbirths between the 20 and 28 weeks of gestation are considered stillbirths by the Model Vital Statistics Act and abortion according to the *International List of Causes of Death*.

If the recommendations made above in supplementing the stillbirth rate by a tabulation of stillbirths of 28 weeks gestation and over are carried out, it would also assist in bringing into accord, at least in practical applications, the two definitions of abortion. The puerperal fatality rate may then relate the total number of deaths associated with the delivery of a live or stillbirth (28 weeks of gestation and over) to all live births plus stillbirths of 20 weeks gestation and over.

The Bureau of the Census bases the maternal mortality rate on live births. The reason, as in the case of the stillbirth rate, lies in the incompleteness of stillbirth registration. However, many states use total births as the basis for computing maternal mortality and stillbirth rates. It would appear desirable to establish uniformity also in this respect. Because stillbirth registration is improving throughout the country and especially because maternal mortality associated with the delivery of a stillbirth is very much higher than that associated with the delivery of a live birth, it appears desirable to use total births (including stillbirths), as a basis for computing maternal mortality rates.

The recommendations of the subcommittee can be summarized as follows:

1. That the maternal mortality rate be based on total births (live births and stillbirths).

2. That in addition to the maternal mortality rate the Bureau of the Census and the individual states publish also puerperal fatality rates, that is, deaths of women who are delivered of live or stillbirths (28 weeks of gestation and over), related to the total number of deliveries of live and stillbirths (28 weeks of gestation and over).

3. In view of the high correlation between survival of mother and survival of offspring, it is recommended that the individual states publish additional details on the puerperal fatality rate. It is desirable to show the rate associated with the delivery of live births separately from that associated with the delivery of stillbirths. This can be accomplished by a process of matching the maternal death certificate with that of the infant's birth or stillbirth certificate.

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Milk and Milk Products*

(Milk, Cream, Butter, and Cheese)

Laboratory Section

THE war emergency has caused many milk control officials to make a special study of milk control procedures. Fortunately the foundations laid by the Milk and Milk Products Committee in the past have been laid so well that the methods outlined in the present Eighth Edition of *Standard Methods for the Examination of Dairy Products* have proved adaptable to all of the emergency situations that have arisen. Thanks to the survey made by Dr. Black (see *A.J.P.H.*, 33:824–832, 1943), there has been increased interest in a real standardization of laboratory technic. This is a highly desirable development.

Because the Army and Navy have practically required the use of pasteurized milk, the milk control program is becoming based even more firmly on the phosphatase test. The fact that the efficiency of pasteurization can be checked so accurately in the laboratory has lessened the necessity for actual time-consuming inspections of equipment, and methods of using equipment in pasteurizing plants. There has been difficulty because inadequately trained workers place a significance on positive findings for coliform organisms that is not justified. The preferred medium for milk testing is sodium formate ricinoleate lactose peptone broth.

The Subcommittee on the Methylene Blue Reduction and Resazurin Tests have been active during the year. Studies made under the supervision of C. A. Abele, Ch.E., Chairman, show that the variations in dye content that are found in the methylene blue tablets now on the market are not large enough to effect results significantly. Moreover, this subcommittee has recommended the establishment of a standard of approximately 9.0 mg. of dye in each 0.5 gm. tablet. This amount of dye will increase the intensity of the color slightly, but not enough to make a real change in the results secured. Dr. C. K. Johns who has studied the resazurin test reports that a 10 minute resazurin test has been adopted for official grading of market milk in Britain. However, in this case, the test is applied only to raw milk which the intake man suspects is not of satisfactory quality. Dr. Johns feels that any milk so near souring that it will cause a marked dye reduction within 10 minutes should be detectable by smell. Under such conditions, the chief value of such a test would be to confirm the intake man's suspicions. In the area covered by the A.P.H.A. this confirmation of the intake man's suspicions is more frequently carried out by making a microscopic examination, as the results secured with this technic yield more complete information regarding the past history of the milk.

The Milk and Milk Products Com-

* Report of the Standard Methods Committee on Milk and Milk Products.

STANDARD METHODS COMMITTEE ON EXAMINATION OF DAIRY PRODUCTS

Organized 1905. Reorganized 1933. Published reports: *Year Books*, 1934–1935, 1935–1936, 1936–1937, 1937–1938, 1938–1939, 1939–1940, 1940–1941, 1941–1942, *A.J.P.H.*, May, 1943. 8 volumes published: 1910, 1916, 1921, 1923, 1929, 1934, 1939, 1941.

mittee with other Standard Methods Committees has followed the agar situation closely. An ample supply of agar of bacteriological grade appears to be available for sanitation control. Under these conditions no substitutes should be accepted for agar of bacteriological grade. No repurified agar should be used. This situation is being watched closely and standards for bacteriological agar are being developed by the U. S. Fish and Wild Life Service.

There is increasing interest in the development of methods for the detection of food poisoning, septic sore throat, typhoid and brucellosis organisms in cheddar and related types of cheese, and a report on this matter is being prepared by a group interested in this field under the direction of Dr. M. W. Yale, *Associate Referee*. The pasteurization of milk for the making of cheddar cheese is developing with the sympathetic help of the industry. It may well be that practically all cheddar cheese will be made from pasteurized milk as quickly as equipment can be made available. Fortunately the phosphatase test can be applied to this type of cheese very nearly as satisfactorily as it can be applied to market milk.

Because excellent use has been made of sediment testing as a means of improving the cleanliness of milk and cream as delivered at cheese and butter factories, a subcommittee composed of Dr. E. H. Parfitt, Dr. J. O. Clarke, and Dr. K. G. Weckel has been appointed to study the standardization of the procedures used. Dr. Weckel presented an excellent review of this problem in the *Journal of Milk Technology*, 6:146–151, 1943.

Because of the interest in the papers presented at the Symposium on Simplification and Standardization of Laboratory Procedures at the St. Louis meeting, separates of these papers have been distributed to 1,200 laboratories doing milk control work in the area covered by the Association.

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Credit Lines

HOW TO FIND WHAT HEALTH EDUCATION MATERIALS YOU'RE LOOKING FOR

AT the request of the Managing Editor, the National Publicity Council for Health and Welfare Services, Inc., 130 East 22nd Street, New York 10, N. Y., has prepared an outline that will guide public health workers, especially those engaged in public health education and in health publicity, to make the best use of available channels of information. Mrs. Beatrice K. Tolleris is the guest editor for this section.

EACH year the National Publicity Council is on the receiving end of hundreds of requests for sources of ready-made health education materials. We are always glad to get them. To our way of thinking, every leaflet, motion picture, radio script or exhibit produced on a health subject is a potential asset to every agency in the field. The wider the knowledge of available material, the less duplication there will be and—even more important—the greater the amount of time, money, and skill freed for other assignments.

This does not mean that other health educators in agencies similar to your own have already turned out exhibits or leaflets which will meet your exact specifications for every conceivable occasion. Rarely will an already finished product be hand tailored to your needs. Very often, however, it will offer you a head start in the shape of valuable suggestions for an adaptation of your own.

Even the materials produced by national agencies for local imprint will probably not fill your total requirements for the year. They may, however, meet a significant proportion of your needs, releasing your time for the production of more specialized materials designed to fit a particular local situation.

How much use you make of other agencies' material depends upon your ability to find out what is available. How you ask for information is almost as important as whether you ask at all.

Assuming that you have a plan and a thought-out purpose behind your every request for a film, or exhibit, or transcription, you will get much better results if you explain that plan when you make your original request.

It is not enough, for example, to request "a leaflet on rheumatic fever." You may get an excellent pamphlet. But it might be addressed to mothers, explaining home care; it might be an explanation of the reasons behind the doctor's instructions; it might be a general discussion of the prevalence of the disease. And perhaps what you really wanted was an appeal for more hospital beds.

On the basis of our own experience, therefore, we have prepared this brief summary of the kinds of details which any agency would probably need before it could fill your requests satisfactorily.

If You Want a Leaflet

Tell us how you are going to use it. What points should it emphasize—i.e.,

prevention, early diagnosis, treatment or community action? To whom will it be distributed? How many copies will you need? Have you any special requirements as to size, cost, etc.?

If You Want a Radio Program

Do you want a script or a transcription? What are the main points it should cover? Do you want a 5 minute, 15 minute, or ½ hour program? Had you planned for a talk, an interview, a round table, or a dramatization? If you want a dramatic script, will you have the services of a professional cast and director or must it be suitable for amateur production? Will it be part of a series and, if so, what characteristics of other scripts in the series should it match? Are you willing to pay the small fee which some agencies charge for copies of their scripts?

If You Want a Film

Do you want to buy or rent it? When, where, and to whom do you plan to show it? Is your projector 16 or 35 mm., sound or silent? If we cannot find exactly what you are looking for, will you be able to use a film on a related subject and tie it to your theme with a talk? How long a film do you want?

If You Want an Exhibit

What kind of people will see it—i.e., doctors, nurses, industrial workers, school children, or the public at large? Will it be alone or part of an exposition? How much space do you have and what kind of space is it—wall space, table tops, store window? What single message do you want the exhibit to carry? If there is no borrowable exhibit which suits your purpose, have you enough time to build your own on the basis of suggestions we send you? If so, how much money do you have to spend? and can you count on the services of an artist, a photographer or both?

Whatever You Want

Tell us the "who, what, when, where, why" as you would in a newspaper release. Remember that if we are working in the dark we probably will not hit the bull's eye.

Whom to Ask

Naturally you are familiar with the resources of your own city and state health departments and of other local agencies in your community. Frequently, however, state departments and associations other than your own are willing to make their material available to you. On the national level, federal departments, voluntary agencies, and even commercial companies are a fertile source of useful material.

The partial list of national sources which follows is currently up-to-date. We have made no attempt to list specific materials offered by these sources, but in many cases catalogs are available and in most cases the name of the agency will indicate the subject matter and scope of its material.

NATIONAL SOURCES OF MATERIAL

American Medical Association, 535 North Dearborn Street, Chicago 10, Ill. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

American National Red Cross, Washington 13, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

American Social Hygiene Association, 1790 Broadway, New York 19, N. Y. Films, pamphlets, posters, exhibits, prepared speeches, catalogs, lists.

American Society for the Control of Cancer, 350 Madison Avenue, New York 17, N. Y. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions.

American Society for the Hard of Hearing, 1537-35th Street, N.W., Washington, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, catalogs, lists.

Maternity Center Association, 654 Madison Avenue, New York 21, N. Y. Pamphlets, posters, exhibits, radio scripts, prepared speeches, catalogs, lists.

National Committee for Mental Hygiene, 1790 Broadway, New York 19, N. Y. Pamphlets, catalogs, lists.

National Dental Hygiene Association, 934 Shoreham Building, Washington, D. C. Films, pamphlets, posters, exhibits.

National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y. Films, pamphlets, catalogs, lists. Posters and exhibits in preparation.

National Organization for Public Health Nursing.

1790 Broadway, New York 19, N. Y. Pamphlets, posters, radio scripts, catalogs, lists. Film in preparation.

National Safety Council, 20 North Wacker Drive, Chicago 6, Ill. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

National Society for the Prevention of Blindness, 1790 Broadway New York 19, N. Y. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

National Tuberculosis Association, 1790 Broadway, New York 19, N. Y. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists. Address requests to nearest state or local tuberculosis association.

Planned Parenthood Federation of America, 501 Madison Avenue, New York 22, N. Y. Pamphlets, posters, exhibits, radio scripts, transcriptions, catalogs, lists.

American Hospital Association, 18 East Division Street, Chicago 10, Ill. One film, pamphlets, radio scripts, prepared speeches.

U. S. Public Health Service, Washington, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, transcriptions, catalogs, lists.

Children's Bureau, U. S. Department of Labor, 14th and Constitutional Avenue, Washington 25, D. C. Films, pamphlets, posters, exhibits, catalogs, lists.

Information Division, Women's Bureau, U. S. Department of Labor, Washington, D. C. Films, pamphlets, posters, exhibits, radio scripts, prepared speeches, catalogs, lists.

John Hancock Mutual Life Insurance Company, Life Conservation Service, 197 Clarendon Street, Boston, Mass. Pamphlets, catalogs, lists.

Metropolitan Life Insurance Company, 1 Madison Avenue, New York 10, N. Y. Films, pamphlets, window exhibits, prepared speeches, catalogs, lists.

National Dairy Council, 11 North Canal Street, Chicago 6, Ill. Films, pamphlets, posters, catalogs, lists.

U. S. Chamber of Commerce, Washington, D. C. Pamphlets, films, exhibits, and posters planned for future production.

Special Sources:

American Film Center, Section on Health and Medical Films, 45 Rockefeller Plaza, New York 20, N. Y. Descriptive lists of health films with sources, prices, suitability for special audiences and a brief evaluation.

Johns Hopkins University, Department of Preventive Medicine, 615 North Wolfe Street, Baltimore, Md. Maintains lending library of health exhibits classified under these headings: nutrition, baby care, dental care, diabetes, sanitation, posture, contagion, mental hygiene, industrial hygiene, civilian safety.

Cleveland Health Museum, 8811 Euclid Avenue, Cleveland, Ohio. Films, slides, posters, exhibits on nutrition, hearing, feeblemindedness, infantile paralysis, cancer, general health, available on loan.

THE 1944 A.P.H.A. CIRCUIT OF MEETINGS IN THE WESTERN STATES

IT will be recalled that in 1943 a new pattern of meetings in western states was developed under which a team of speakers organized by the American Public Health Association, and with the coöperation of various organizations, made a circuit of 11 state and regional meetings in the West. In response to a demand from a larger number of states in 1944 it was decided to repeat this pattern and to organize a group of specially selected speakers. The officers of the Western Branch, in cooperation with the Executive Secretary of the Association, organized the following team.

Arthur Massey, C.B.E., M.D., D.P.H., Medical Officer of Health, Coventry, England

W. Ford Higby, Secretary, Western Branch, A.P.H.A., Secretary California Tuberculosis Association, San Francisco, Calif.

Chauncey D. Leake, Ph.D., Dean, University of Texas School of Medicine, Galveston, Tex.

Charles E. Lyght, M.D., Director of Health Education, National Tuberculosis Association, New York, N. Y.

Martha W. MacDonald, M.D., Psychiatric Services Adviser, U. S. Childrens Bureau, Washington, D. C.

Karl F. Meyer, M.D., Ph.D., Director, Hooper Institute, University of California, San Francisco

Ellis S. Tisdale, Sanitary Engineer, U.S.P.H.S., Washington, D. C.

Pearl McIver, R.N., Principal Public Health Nursing Consultant, U.S.P.H.S., Washington, D. C.

Henrietta Landau, R.N., Public Health Nursing Consultant, U.S.P.H.S., Denver, Colo.

William P. Shepard, M.D., San Francisco, Calif., Metropolitan Life Insurance Company, Pacific Coast

Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A., New York, N. Y.

Carl E. Buck, Dr.P.H., Field Director, Committee on Administrative Practice, A.P.H.A., New York, N. Y.

George T. Palmer, Dr.P.H., Associate Field Director, Committee on Administrative Practice, A.P.H.A., New York, N. Y.

The meetings began in early May with the sessions in Des Moines of the Iowa Public Health Association, following which the team moved to Minneapolis where the State Department of Health had invited the team's participation in the annual conference of official health workers. Then followed the meeting of the Illinois Public Health Association in Chicago, and a meeting in Madison of the public health workers of Wisconsin, where the team of speakers participated on the first day of a three day meeting. Further stops were arranged in Fargo, N. D., in Helena, Mont., where the Montana Public Health Association met, in Spokane, Wash., for the meeting of the Washington Public Health Association, in Moscow, Idaho, for the Idaho Public Health Association, and in Portland, Ore., where a newly organized Oregon Public Health Workers Association had planned a three day meeting.

Extraordinary attendance records were established in these states which made very apparent the enthusiastic welcome extended by the public health workers. They appreciated the fact that national speakers of note were brought near to the front line public health worker himself. In many cases this was the first meeting which some of the nurses, engineers, sanitarians, and the health officers had ever attended where nationally prominent participants were in attendance. The programs were organized on a teaching basis and were of the refresher course variety. Audience participation was cultivated throughout. The final Round Up sessions were lively exchanges between members of the team and members of the audience based on practical questions submitted by those in attendance.

After Portland the team moved to Sacramento for the meeting of the Northern California Public Health Association, and then to Pasadena for the Southern California group. These California workers attended to the number of about 1,000 for very enthusiastic meetings. The stop in Salt Lake City for the meeting of the Utah Public Health Association was filled particularly full for the team members who appeared three and four times each, and the meeting of the Colorado Public Health Association in Denver was similarly crowded full of lively participation and of dealing with practical problems. The members of the team were regretful that transportation difficulties made it impossible to meet with the New Mexico Public Health Association as planned, but they felt very gratified at the total attendance of more than 5,000 persons in the 13 sessions which were held among the 12 states. Already requests have been received to hold repeat performances in some of these states in 1945, but it is too early to predict whether the Executive Board of the Association will authorize a similar tour next year.

The American Public Health Association and its Western Branch are particularly grateful to the coöperating agencies which made possible the coming of these speakers, including the City Council of Coventry, England, and the British Information Services, the University of Texas, the National Tuberculosis Association, the Children's Bureau, the Hooper Institue of the University of California, the U. S. Public Health Service, the Metropolitan Life Insurance Company, and the many local groups whose coöperation enriched the program.

The central figure of the meetings of 1944 was Dr. Arthur Massey, who was selected to represent his British colleagues by the Ministry of Health of Great Britain. Dr. Massey was a splendid interpreter of current practices in Great Britain, with special reference to the emergency, to health education, and to the British pattern of medical

care as reflected in the White Paper which the British Government has submitted to Parliament.

Dr. Massey, on request, has summarized his impression of the trip as follows:

"My first impression of the United States was the skyline of New York. It exceeded my expectations, although I had expected a lot. I was struck by the geometrical pattern of the streets, for from the ship I could see the whole extent of long parallel thoroughfares. The impression was one of bold architecture and superb town planning. My subsequent few days in New York City confirmed these initial impressions. Naturally, my first reaction was in response to the lights on my first night in New York. It was a thrill to me to see a lighted city after four and a half years of complete blackout.

"I was told that our tour would be a grueling one. But its strenuous nature was more than offset by its congeniality. It is a gamble to bring a party of people together to spend some weeks traveling around as a team; but I was early reassured because there was complete compatibility with and between all members of the party. We were fortunate in that our first meeting at Des Moines was a highly successful one at which we received most cordial treatment at the hands of Dr. Walter Bierring, who is a master in the art of hospitality. Iowa set a high standard which was maintained throughout the tour, and I feel personally indebted to all the responsible officers at each meeting place for their unfailing courtesies and unremitting help.

"A first visit to a great country like the United States is a memorable experience, especially in view of the wide geographical variations state by state which give one a constantly changing chain of impressions. The latter tend to divide themselves into compartments according to geography. In the Middle West I saw two extremes, from the immensity and sophistication of Chicago to the sparseness and romance of the ranch lands of North Dakota and Montana. In between were the rich agricultural terrains of Minnesota and Wisconsin. Then I have vivid impressions of the Columbia River Country, joining Washington State, Idaho, and Oregon. California I place in a category alone and the word will always conjure up in my mind a picture of the blue Pacific Coast, sub-tropical fruits, redwood trees, and film stars. All these I saw during my visit and I was nowhere disappointed. I especially recall a certain recherché luncheon in San Francisco given in my honor by Dr. Karl Meyer.

"Having crossed the arid Mojave Desert, I felt the great contrast between it and the freshness and hospitality of Salt Lake City. The final call at Denver I associate with the scenic Rocky Mountains of Colorado and with a motor trip to the heights and with an excellent weekend's trout fishing. A certain club dinner given by Dr. Fred Foard is one of many happy landmarks.

"I am not sure that I ought to have mentioned any specific occasions of the tour because all the trip was similarly enjoyable. It was due to the generosity of the organizing officers at each stop and to the congenial company provided by members of the team. All of these it is my privilege to regard as permanent friends. I can only hope that if a team is formed for a tour next year they will be as thoroughly happy together as we have been this year.

"I feel that the members of the team were most amused at my obvious enjoyment of vanilla ice cream twice daily and of my breakfast of bacon and two eggs each morning. These are great treats to one from Great Britain nowadays!

"At the end of the tour I was convinced that the team had done a considerable service at the various state

health meetings by imparting up-to-date knowledge, and above all by submitting eagerly to the barrage of questions which everywhere characterized the 'round up' sessions. At every meeting we taught and learned.

"I am looking forward to telling Sir Wilson Jameson (Chief Medical Officer, Ministry of Health, England) of the excellent experiences I have had, and of thanking him and also the Coventry City Council for the opportunity they gave me for visiting a great and progressive country.

"My final word is one of very cordial thanks to the American Public Health Association and to the Secretary, Dr. Atwater, for making these arrangements possible and for their wonderful treatment of their guest from England."

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Clinical Tropical Medicine—*Edited by Z. Taylor Bercovitz. New York: Hoeber,* 1944. 957 pp. Price, $14.00.

This new textbook of tropical medicine has been prepared with the cooperation of twenty-seven contributors, including the editor. In this method of preparation the book differs from the other recent textbooks of tropical medicine in the English language. The contributors are all among the best authorities in their respective fields, and some of the sections are the best that the reviewer has seen in textbook form. Each contributor has apparently been given a wide latitude in presentation, although each disease is considered under the usual textbook headings.

Among the most valuable sections are those on the diseases caused by Rickettsiae by Henry Pinkerton, those covering pinta and yaws by Howard Fox, yellow fever by Fred L. Soper, psittacosis by K. F. Meyer, tularemia by Lee Foshay, undulant fever by A. V. Hardy, leprosy by George W. McCoy, nutritional diseases by Edward B. Vedder, and mycotic diseases by Morris Moore. A few of the sections are rather superficial in presentation and are poorly organized, such as the section on diarrheal diseases, where some of the intestinal protozoa are presented in more than one place, and the classification of all of the intestinal flagellates is given under giardiasis after the individual members of the group have been presented in the previous chapter. In the chapter on bacillary dysentery, the bacteriology of the disease has received insufficient attention and, under treatment, polyvalent antiserum is given a prominent place without reference to type of organism involved.

The chapter on arthropods is limited to those injuring man and does not relate them sufficiently to the transmission of diseases. Unfortunately, this section was not prepared by a medical entomologist.

The illustrations are numerous and excellent. Many of them have been borrowed from other standard works, such as Dobell's *Monograph on the Intestinal Portozoa* and Wenyon's *Protozoology*. Many others are original, those in the section on mycoses being particularly good. The book is published in excellent style and is unusually free from typographical errors. One only wishes that such textbooks could be printed on paper which would make the volume easier to handle. It will prove to be a valuable reference book for medical students, instructors, public health departments, and physicians who are interested in tropical medicine, but it should be supplemented by other modern textbooks.

HENRY E. MELENEY

The Youngest of the Family—His Care and Training—*By Joseph Garland, M.D. (rev. ed.). Cambridge, Mass.: Harvard University Press,* 1943. 182 pp. Price, $2.00.

This is a new edition of another of the many books written to help mothers raise babies. It contains a good discussion of the variations in growth and development commonly observed in children, and calls for a common sense attitude toward clothing. In general, the approach is one of tolerance and understanding, but there will be considerable disagreement with the author's advice on very early toilet training.

Insistence on breast milk for prema-

ture infants seems hardly justified when there is so much evidence that other milks may be at least as satisfactory.

MYRON E. WEGMAN

Pathology and Therapy of Rheumatic Fever—*By Leopold Lichtwitz. New York: Grune & Stratton,* 1944. 198 pp. Price, $4.75.

Dr. Lichtwitz's book is based on the thesis that rheumatic fever is an allergic disease. In order to develop this theory, experimentally proven facts are intermixed with clinical impressions and rules of thumb. The discussion of the relationship of the central nervous system to the allergic theory of acute rheumatic fever is particularly obscure. Although this theory may finally prove to be correct, the case for it has not been clearly made in this volume.

The text of the book is not limited to rheumatic fever but to rheumatic manifestations of many diseases. There is a constant intermingling of statistics and facts relating to various types of rheumatic disease so that, even for one somewhat familiar with the literature, it is difficult to follow the argument. For those interested in theorizing discussions of rheumatic fever, the reading of the early chapters of this book may provide the framework on which experimental studies may be designed. It is of interest that in this book on rheumatic fever, even in the discussion of prognosis, the words "sub-acute bacterial endocarditis" never appear. This book is definitely not designed for the general practitioner.

The charming foreword by William J. Maloney makes excellent reading.

DAVID D. RUTSTEIN

War and Children — *By Anna Freud and Dorothy T. Burlingham. New York: International University Press,* 1943. 191 pp. Price, $2.00.

This small book was written primarily for American parents but it has a message for a much wider audience, among parents of all countries as well as professional workers in public health, medicine, education, and psychology. The authors are pioneers in nursery school work, Anna Freud being the daughter of Sigmund Freud who introduced psychoanalysis, while Dorothy T. Burlingham is an American psychologist. Both have long been interested in the psychological development of children and have fostered the development of facilities wherein are provided proper emotional relationships for the child.

The war brought the authors to England where they established three nursery schools which differ greatly from the customary peacetime nursery schools or day nurseries of the Continent and the United States, and which resemble more a kind of foster home.

The book is written simply and clearly, and has excellent illustrations. It is divided into two main divisions; part one deals with such things as the psychological reactions of the child to destruction, air raids, evacuations, and separation from parents, and formulates practical methods of dealing with the behavior set-off by these traumatic influences; part two is made up of reports and case records of individual children and gives in detail the reactions which are discussed more generally in the preceding part; there is included an outline, with some discussion, of the training courses for young women who work in the nurseries.

The book not only provides facts which are of interest in terms of psychological reactions of children to unusual trauma but points out clearly the relationship between emotional maladjustment and the home life in the first five years of life. This book then becomes a primer of child care in peacetime as well as a record of the disastrous influence of war.

MILTON J. E. SENN

A Survey of Alcohol Education in Elementary and High Schools in the United States—*By Anne Roe, Ph.D. New Haven, Conn.: Quarterly Journal of Studies on Alcohol,* 1943. 132 pp. Price, $1.00.

For a long time many of us have suspected that something was definitely wrong with teaching practices and teaching materials in alcohol education. Fortunately Dr. Roe has performed a most successful "exploratory operation" on the "subject" of alcohol education as it is now presented through the medium of health education textbooks prepared especially for use by children and by adolescents in public, private and parochial schools throughout the United States. One hundred and sixty-six books and publications, including 137 textbooks, were explored. Current teaching practices and teaching materials are tabulated systematically, and are discussed critically from the standpoint of scientific validity and pedagogic caliber.

Dr. Roe's "operative" findings disclose that a considerable portion of the material about alcohol knowledge in these textbooks is scientifically invalid. Many of the writers display a tendency to vagueness of terms, and indiscriminate generalizations. These same authors frequently present material without foundation of scientific fact, especially when speaking of alcohol as a habit-forming drug, a poison or narcotic, when describing the effects of alcohol on nutrition, on resistance to disease, on heredity and longevity, and when including statistics concerning alcohol as a direct or contributory cause of disease. One of the chief faults to be found with discussions on alcohol as a poison or narcotic, is the complete disregard in nearly all of the textbooks of the distinction between the effects of drinking small amounts of alcohol and of excessive drinking. Authors rarely keep this distinction clear. Instead, they seek to espouse the cause of total abstinence rather than to present the known facts about alcohol and its effects.

The latter half of the book deals with the legal regulations of alcohol education and analyzes those laws of the states which make mandatory the inclusion of alcohol education in the school curricula. There is an excellent list of standard references, an exhaustive bibliography of textbooks which the author reviewed in her searching analysis of alcohol education, and a bibliography of state laws on alcohol education. Members of committees on health education textbooks and authors of such books will find it to their advantage to read this volume.

I. H. GOLDBERGER

Manual of Industrial Nutrition. 25 pp.

Planning Meals for Industrial Workers. 28 pp.—*By Food Distribution Administration, Nutrition and Food Conservation Branch, U. S. Department of Agriculture. Washington, D. C.: U. S. Govt. Ptg. Off.,* 1943.

The Food Distribution Administration of the U. S. Department of Agriculture has issued these two pamphlets as the first of a series designed to aid in the program of raising the nutritional status of the vast numbers of workers engaged in American industry. In the preparation of these brief manuals the Nutrition in Industry Division of the Nutrition and Food Conservation Branch has rendered a valuable service by concisely presenting how any industrial plant or community may undertake the protection or obtain advice on how to protect the health of industrial workers through good nutrition.

The *Manual of Industrial Nutrition* provides an excellent outline of the job to be done and the technics which are proving successful in meeting a long-

time need greatly aggravated by wartime industrial conditions. It is worthy of comment that attention is given not only to what can be accomplished by a sound nutrition program but also to factual refutation of some of the claims that a single or multivitamin preparation will provide an answer to all industrial medical problems.

The second pamphlet, *Planning Meals for Industrial Workers,* should prove useful to those responsible for the actual planning and supervision of meals. THOMAS D. DUBLIN

Physical Fitness Through Health Education for the Victory Corps, 1943. 98 pp. Price, $.20.

Handbook on Physical Fitness: For Students in Colleges and Universities, 1943. 140 pp. Price, $.25—*Prepared by a committee appointed by the U. S. Commissioner of Education with the collaboration of the U. S. Army, the U. S. Navy, the U. S. Public Health Service, and the Physical Fitness Division of Defense Health and Welfare Services. Washington: Supt. of Documents, U. S. Govt. Ptg. Off.*

These manuals are approved by the representatives of the Army, Navy, U. S. Public Health Service, and U. S. Office of Education. Representative and well qualified persons, including teachers of physical education, health education experts, medical and other specialists, served as special committees to prepare the manuals.

There can be no doubt that physical education and health education in secondary schools, colleges and universities have been advanced greatly during the war, and that the initial stimulus came from manuals such as these, developed by the various departments of the federal government. The urgency of the war effort has broken down departmental lines. Physical fitness is being stressed even at the expense of other studies and practices. Directors, principals, classroom teachers, physical education teachers, school physicians, and nurses, health department health services, and numerous voluntary agencies, are now working together as never before in the efforts to find physical and dental defects and have them corrected, to prevent and control communicable diseases, improve nutrition, physical fitness and endurance.

These manuals suggest methods and technics for action as well as giving specific advice and information.

The first manual, *Physical Fitness Through Health Education for the Victory Corps* provides six objectives as a basis for a wartime emergency program on health education in high schools. These include: (1) correction of remediable defects; (2) prevention and control of communicable diseases; (3) improvement in nutrition; (4) prevention of accidents and training to assist in giving emergency care; (5) daily program planning for balanced living; and (6) development of sound mental attitudes.

The *Handbook on Physical Fitness for Students in Colleges and Universities* seems also to have met a decided need. From physical education experts with whom the reviewer consulted, he learns that for men, the manual contains excellent material which can be elaborated and expanded according to facilities available. It provides a well rounded program and counteracts the over-stressing of intramural and intercollegiate sports. For women, the all-round program suggested has been received as sound and useful. The chief complaint seems to be that in many colleges and universities, the time and the personnel available are insufficient adequately to carry out the suggested program.

John W. Studebaker, U. S. Commissioner of Education, states:

In light of contemporary developments, it

has become increasingly apparent that our colleges and universities can perform no greater service at this time than to provide programs and facilities through which their students may become physically fit. Physical fitness may mean the difference between life and death for men entering the armed forces. Physical fitness is also of utmost importance to men and women who participate in industrial and agricultural programs.

This manual points out with authoritative information how to reach the above ends. CARL A. WILZBACH

A Hundred Years of Medicine—*By C. D. Haagensen and Wyndham E. B. Lloyd. New York: Sheridan House,* 1943. 444 pp. Price, $3.75.

This American edition of a series of essays on the history of modern medicine (which has also appeared in an English edition) is another of the many attempts in recent years to popularize the subject. This one has some advantages for the public health worker, for it touches on subjects of interest to him which many others do not, as, for example, the sanitary conditions and the state of hospitals in the 1800's, as well as the social aspects of medicine as seen today. But, in general, the story is that of the developments of chemotherapy and anesthesia, the conquest of various diseases, the rise of certain specialties (neurosurgery, orthopedics), the use of radium and vitamins, etc. The authors have done well in tracing chronologically the development of their separate topics. The story is told, however, in a style that left this reader less than convinced that it would satisfy either the layman or the expert. The confusion seems due to a mixture of technical and everyday language and to the hodge podge of biographical anecdote and anatomic, bacteriologic, or clinical background which adorn the tale. In view of the many new subjects discussed, it is surprising that those of air sterilization and the relationship of jungle fever to yellow fever control were omitted. Despite these shortcomings, the volume does contain a substantial amount of accurate information on the developments in medicine in the past one hundred years.

LEONA BAUMGARTNER

Nutrition Reviews. *Vol. 1, Nos. 1–14. November,* 1942–*December,* 1943. *New York: Nutrition Foundation,* 1944. 443 pp. Price, $2.00, Domestic subscription; $2.50, Foreign.

If any further proof of the tremendous expansion of the field of nutrition were needed, it might be found in these more than 400 pages of abstracts covering 14 issues of this monthly publication of the Nutrition Foundation, New York, N. Y. A critical review of the contents would be as difficult as reviewing the encyclopedia. One must recognize, however, the compentence of the staff of reviewers and be grateful for this public service of the Nutrition Foundation. For succinct and yet comprehensive presentation of the literature, this volume has few equals.

REGINALD M. ATWATER

Physical Fitness for Girls: *Contributions of Physical Education to War-Peace Programs in Secondary Schools—By Rosalind Cassidy, Ed.D., and Hilda Clute Kozman, Ph.D. New York: Barnes,* 1943. 223 pp. Price, $2.00.

Fitness First: *A Physical Fitness Workbook for High School Girls—By Hilda Clute Kozman and Rosalind Cassidy. New York: Barnes,* 1943. 32 pp. Price, $.60.

These books have been written to enable schools to meet the immediate wartime demands on secondary instruction, but present a program so practical and a philosophy so appealing that their usefulness will extend far beyond

the "duration" into the years when peace and security are once more taken for granted by education. The textbook is designed specifically for college students who are preparing to be teachers of girls in the high school physical education program. This is not, however, an inclusive text; its "materials and methods are delimited to those thought suitable for building understandings and skills in endurance, strength, body control, relaxation and morale in an orientation course" (p. 45). The authors state plainly that they do not advocate discarding the valuable program already established in girls' physical education, even though they make no attempt to describe this in detail. It is important for the reader to have this limitation clearly in mind; otherwise the plan presented will seem narrow and somewhat poverty-stricken, in comparison to the wealth of activities, goals, and materials characteristic of modern physical education.

To "redirect emphasis to elements of physical fitness that have always been important for the physical education teacher," the authors suggest an orientation course, given first for all girls in the school, later for new girls and for those who can profit by its repetition. The assumption is that graduates from the orientation program will go on to such activities as sports, dancing, etc., now characteristic of secondary school offerings. The book offers a way of meeting the urgent wartime demand for revising present-day programs, without returning to gymnastic regimentation and autocratic response-command systems. "The disciplines of democracy are self-discipline, self-control and self-direction . . . in coöperation with others for the common good" (p. 40). In a time when there is thoughtless acceptance of "commando" training as proper activity for young girls in school and college, it is more important than generally realized to have such a book as this, which Lindeman in his Preface felicitously describes as "both an antidote for the wrong type of physical education for young girls and a straightforward, usable plan for something better" (p. V).

School health officers, both physicians and nurses, will find encouragement and appreciation of their services in this teacher training text; and they will not find themselves embarrassed by careless statements or naïve enthusiasms. Experience, reflection, wisdom, as well as specialized knowledge and competence, have gone into the making of these books.

EDNA W. BAILEY

Manual for Water Works Operators—*By the Texas Water Works Short School. (rev. ed.) Austin: Texas Water Works Short School,* 1943. 392 pp. Price, $3.00.

This represents a condensed reference work on the operation of public water supply systems. It is a useful volume for all local water supply officials, although intended primarily for those of Texas. The revised edition adds 106 pages and new features to the first edition of 1938. The Drinking Water Standards of the U. S. Public Health Service and the associated manual are reprinted as an appendix.

Twenty-three authors have contributed a series of chapters upon sources and protection of water supply, pumping, metering, treatment (7 chapters), distribution system maintenance, storage, industrial water supplies and the requirements of several Texas State Departments pertaining to water supplies. Several appendicies and a comprehensive index complete the volume.

Within the scope of a condensed reference work much information is given as to all aspects of the opera-

tion of public water supplies. The volume will be of chief value to those desiring a fundamental knowledge as to the general field of operation rather than to specialists interested in the restricted aspects of water supply or water purification plant operation.

As might be expected with a text prepared by so many authors, there is a certain lack of functional coördination in the discussion of several aspects of water quality and the related processes of water treatment. Thus one finds disconnected portions of the text dealing with different aspects of the same general subject, such as water chlorination. Occasionally the text overemphasizes certain technical details at the expense of operating details. For instance, Chapter XII entitled "Algae and Water Supplies" presents in a useful form the biology of aquatic vegetation, but contains only one short paragraph on methods of application of copper sulfate for algae control, and no mention is made as to the practical aspects of collecting representative samples for microscopical examination to enable control procedures to be intelligently utilized.

In a similar way the discussion of the chlorination of water makes no mention of the effects of water temperature, pH, available period of contact before the treated water is delivered to the first consumer, nor of the practical use of the orthotolidine test in compensating for such influences. Furthermore, no mention is made in the directions for the orthotolidine test of errors due to nitrate, manganese, color, turbidity, etc.

The chapter on bacteriological examination of water represents a popular review of the standard laboratory procedures but presents no background as to general water bacteriology nor as to the interpretation of the results of the examinations in terms of purification plant and water supply control.

Notwithstanding these and similar deficiencies, the revised edition of this book represents a convenient reference work as to all aspects of public water supply operation which should be of greatest assistance to those desiring general information upon those aspects of water supply operation which are foreign to their experience.

C. R. Cox

Red Cross Home Nursing—*By Lona L. Trott, R.N. B.S., School Edition edited by Gertrude E. Cromwell, R.N., M.S.* Illus. Philadelphia: Blakiston, 1943. 363 pp. Price, $1.00, cloth, $.60 paper.

This book has been especially prepared for use with senior high school students. Much of the material was adapted from the former *American Red Cross Textbook on Home Nursing.* New and revised material on general health is included in the chapters (Section 1) on "Personal Readiness to Meet Everyday Problems." The presentation of the subject matter in the other three sections *i.e.,* When Sickness Invades the Home, Understanding Child Growth and Development, and Protecting the Health of Our Homes and Community, should appeal to 11th and 12th grade students.

The presentation in Section 1 may be found too elementary for the present-day high school age group.

Drawings and photographs are effectively used to illustrate many of the simple nursing technics.

Teachers of Red Cross home nursing courses in high school should welcome this long overdue textbook.

LULU ST. CLAIR BLAINE

Handbook for Use of Instructors and Administrators — *Red Cross Home Nursing, School Edition, American Red Cross, Washington, D. C.,* June, 1943. 54 pp.

The new and the experienced teacher

should find this handbook useful in planning for and carrying out a home nursing instruction program in senior high schools. It was designed to be used in conjunction with the textbook *Red Cross Home Nursing*. How to organize classes and to fit the course into the school program is outlined. Materials needed for the course are listed. Suggestions for use of the materials are offered, as well as a reading list for the instructor. This handbook should be indispensable to any instructor of home nursing.

LULU ST. CLAIR BLAINE

Handbook for the Etiology, Diagnosis and Control of Infectious Bovine Mastitis—*By Ival Arthur Merchand and R. Allen Packer. Minneapolis: Burgess Publishing Co.*, 1943. 66 pp. Price, $1.25.

This handbook has been prepared for students from lecture notes and field experience. It is also valuable for the practising veterinarian as it contains concentrated, up-to-date information concerning this important disease. Various chapters discuss the predisposing factors, the bacteriology of mastitis, and the diagnosis, control, and treatment of the disease. The disappointing feature of this summary, as must be the case with all summaries of our present knowledge, is that no adequate cure, control, or eradication program can be presented for this wasteful scourge.

ROBERT S. BREED

Brucellosis in Man and Animals—*By I. Forest Huddleson. (rev. ed.). New York: Commonwealth*, 1943. 379 pp. Price, $3.50.

Economically, and considering occurrence and duration of infection, Brucellosis now assumes first place among diseases transmissible from animals to man. It is fitting and fortunate that this book should have as its author a veterinarian, an investigator recognized internationally as an authority on this subject.

Seven Chapters are arranged as follows: I—The Genus Brucella, II—Methods of Isolating Brucella, III—Differentiation of the Species of the Genus Brucella, IV—Brucellosis in Human Beings, V—Brucellosis in Animals, VI—Laboratory Diagnosis of Brucellosis, and VII—Eradication or Control of Sources of Brucella Infection.

In Chapter IV, Part Two, "Brucellosis in the United States," was contributed by A. V. Hardy, M.D., Consultant U. S. Public Health Service, and Part Three, "Brucellosis in Malta," by J. E. Debono, M.D., of the Royal University of Malta. Chapter VII and the Preface were written by Ward Giltner, D.V.M., Dean of the Veterinary Division of Michigan State College.

This book embodies a wealth of information pertaining to symptomatology, diagnosis, and methods of treatment (sulfatherapy, brucellin, artificial fever therapy), and will prove a valuable guide to physicians. The volume is essential to bacteriologists and laboratory workers, whose interest is the study of brucella, its isolation, species differentiation, and laboratory diagnosis. Veterinarians, livestock sanitarians, and public health administrators will learn much from this book about Brucellosis in animals, including the present status of calfhood vaccination with strain No. 19.

The treatise incorporates an appendix of case reports, a bibliography with 485 references, significant historical high lights, and a stimulus which will lead to further knowledge, more effective control, and prevention of an important but partly known communicable disease.

CARL F. JORDAN

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Outspoken Reporting — Gordon Bates tells of an increase in syphilis in his city, and, what is more disturbing, an increase in recently acquired syphilis. He found this out by asking the doctors, as he does from time to time.

BATES, G., A Survey of the Incidence of Venereal Diseases in Toronto in 1943. Canad. Pub. Health J. 35, 6:234 (June), 1944.

Where Polio Struck—If in nothing else, you will be interested in the map showing the nation-wide distribution of poliomyelitis in 1943. In the discussion of the behavior of this disease, it is pointed out that neither differences in climate, geography, density of population, nor racial characteristics seem to be factors of importance in accounting for variations in numbers of outbreaks.

DAUER, C. C. Prevalence of Poliomyelitis in the United States in 1943. Pub. Health Rep. 59, 22:712 (June 2), 1944.

Rheumatic Fever in England—"Rheumatism may lick the joints, especially in childhood, but it bites the heart." Nice aphorism, isn't it? The paper, otherwise, is good, too.

DONOVAN, G. E. Some Aspects of Cardiovascular Disease With Special Reference to Public Health. Pub. Health. 57, 8:85 (May), 1944.

Good Works — Wholesomely frank is this review of how little we really know about poliomyelitis. The activities of the National Foundation in supporting research, training physicians, nurses and technicians—1,300 since 1942—and disseminating information are recounted with a pleasing absence of self-administered back-patting.

FISCHOFF, E., and GUDAKUNST, D. W. The Fight against Infantile Paralysis Continues. Am. J. Nurs. 44, 6:533 (June), 1944.

The Professors Look at Kenny—After pulling the wobblier of the props out from under some of Sister Kenny's overenthusiastic claims for her method, this committee admits, a little grudgingly, that her contentiousness "has stimulated the medical profession to reëvaluate known methods of treatment." For that understatement the eminent professors should be awarded the big brown derby!

GHORMLEY, R. K., *et al.* Evaluation of the Kenny Treatment of Infantile Paralysis. Report of Committee. J.A.M.A. 125, 7:466 (June 17), 1944.

Papers-of-the-Month — Whether you sit behind an executive's desk, or before a laboratory table, or visit homes, or inspect food handling establishments, you should read this symposium on "The Treatment of Burns." As one of the writers says "much controversial matter appears to have been settled," and you owe it to yourself to be informed about the settlement. So you'll find no superficial abstracting done here. There will be seven papers in all: read all seven.

HARKINS, H. N. The Problem of Thermal Burns (and six related papers). J.A.M.A. 125, 8:533 (June 24), 1944.

For Venereal Patients Who Can Pay—Every health administrator will be interested in this straightforward account of an effort to increase the proportion of venereal patients treated by practising physicians in Philadelphia. The program did materially improve the previously tragic picture and the method might find applications in the epidemiology of other diseases.

INGRAHAM, N. R., and GREENBAUM, S. S. Public Health Venereal Disease Control. J.A.M.A., 125, 8:527 (June 24), 1944.

For Your Soul's Good—Unless we who work in health . . . are ourselves free from prejudice and intolerance, we cannot hope to work with full effectiveness, says this fellow, who takes intolerance apart to see " what makes it tick."

KILPATRICK, W. H. Applied Democracy in Inter-Group Relationships. Pub. Health Nurs. 36, 6:265 (June), 1944.

" Who Owns Health? "—We learn from the President of the A.M.A. that venereal diseases are almost completely controlled; that pneumonia is no longer a danger; that cerebrospinal meningitis mortality is now about 5 per cent; that the local medical profession will readily take care of whatever pellagra is found; that as a result of the wonderful achievements of medicine the life span has increased from 40 to 65 years; that army doctors wonder what they are fighting for; that under our present system of medical practice the people of this country have enjoyed the best health record of any nation on earth.

KRETSCHMER, H. L. American Medicine and the War. J.A.M.A. 125, 7:461 (June 17), 1944.

Next-Steps-in-Science Department—It seems that when suspensions of bacteria or viruses are allowed to flow in a ribbon-like stream past a new type of ultra-violet lamp they are rapidly inactivated, and with a minimum loss of antigenicity. This paper tells about the results of such treatment on colon, typhoid, and certain salmonella, streptococcus and pneumococcus cultures. Rabies and encephalitis vaccines treated in this way induced a high degree of immunity in mice.

LEVINSON, S. O., *et al.* Production of Potent Inactivated Vaccines with Ultra-violet Irradiation. J.A.M.A. 125, 8:531 (June 24), 1944.

Medical Care for All Canadians—That all the known health measures conducive to the prevention and control of illness should be made available to all people is axiomatic, says the Minister of Pensions and National Health. The solution of the problem of the provision of adequate medical care lies in health insurance, he adds. Rugged individualists hereabouts will disagree with his extension of these introductory remarks.

MACKENZIE, I. A. Health Insurance. Canad. Pub. Health J. 35, 6:213 (June), 1944.

About Beautiful Ideas That Turn Sour—A successful boomerang is something you throw into the air and which hits you in the back of the neck if you don't watch out. As a great many health publicity ventures seem to turn into that kind of boomerang, every administrator with a yen for health education, will profit by reading this excellent dissertation. Incidentally, this is but one among many such stimulating papers that have appeared recently in *Channels* only to be ignored in this bibliography. To the able editors of *Channels* go my abject apologies for this neglect.

MERTON, R. K., and KENDALL, P. L. The Boomerang Response. Channels. 21, 7:1 (June), 1944.

" Telling All " to High Schoolers—Reporting upon a two year experience with the group-discussion method of venereal disease education (for high school youngsters) in which men and women speakers furnished by the divisional health department lead the discussions. Integration of social hygiene in the science units may be a preferred method, but this one works too, is the claim of these Canadian writers.

RHODES, H. C., and CAPELLE, P. M. C. Venereal-Disease Education in the High School. Canad. Pub. Health J. 35, 5:181 (May), 1944.

Despite Ecclesiastes 1:8—Not to be confused with infections mononucleosis, is still a newer disease—acute infectious lymphocytosis — which threatens to add to the epidemiological troubles of the public health fraternity. As it is a communicable condition, with upper respiratory symptoms most frequently featured, epidemiologists had better acquaint themselves with the differential diagnosis discussed in this paper. Still another virus is suspected.

SMITH, C. H. Acute Infectious Lymphocytosis: A Specific Infection. J.A.M.A. 125, 5:342 (June 3), 1944.

Moses Was a Shrewd One—Exposure to trichinosis infestation is nearly uniform regardless of geographical or environmental factors. Evidence in hand points to the need for nation-wide preventive action.

WRIGHT, W. H., and WALTON, A. C. Studies in Trichinosis. Pub. Health Rep. 59, 21:669 (May 26), 1944.

BOOKS RECEIVED

MEDICAL EDUCATION IN THE UNITED STATES BEFORE THE CIVIL WAR. By William Frederick Norwood. Philadelphia: University of Pennsylvania Press, 1944. 487 pp. Price, $6.00.

PSYCHIATRY AND THE WAR. Edited by Frank J. Sladen. Springfield, Ill.: Thomas, 1943. 464 pp. Price, $5.00.

PRACTICAL MALARIA CONTROL. A Handbook for Field Workers. By Carl E. M. Gunther. New York: Philosophical Library, 1944. 91 pp. Price, $2.50.

VIRUS DISEASES IN MAN, ANIMAL AND PLANT. By Gustav Seiffert. New York: Philosophical Library, 1944. 332 pp. Price, $5.00.

THE PATHOGENESIS OF TUBERCULOSIS. By Arnold R. Rich. Springfield, Ill.: Thomas, 1944. 1008 pp. Includes 35 page index, 89 figures, 20 tables, 1417 references, 4 charts. Price, $10.50.

ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS. Including Its Relationship to the Broader Aspects of Collapse Therapy. By T. N. Rafferty. Illus. New York: Grune & Stratton, 1944. 192 pp. Price, $4.00.

THE ELECTROCARDIOGRAM. ITS INTERPRETATION AND CLINICAL APPLICATION. By Louis H. Sigler. Illus. New York: Grune & Stratton, 1944. 403 pp. Price, $7.50.

THE PUBLIC HEALTH NURSE IN THE COMMUNITY. By Clara B. Rue. Philadelphia: Saunders, 1944. 283 pp. Price, $2.50.

ELIMINATION DIETS AND THE PATIENT'S ALLERGIES. A Handbook of Allergy. By Albert H. Rowe. 2nd ed. thoroughly revised. Philadelphia: Lea & Febiger, 1944. 256 pp. Price, $3.50.

FOOD ENOUGH. By John D. Black. Lancaster, Pa.: The Jacques Cattell Press, 1943. 269 pp. Price, $2.50.

THE U.S.S.R. IN RECONSTRUCTION. A Collection of Essays. By The American Russian Institute. New York: The American Russian Institute, Inc., 1944. 160 pp. Price, $1.00.

PRINCIPLES AND PRACTICES OF INHALATIONAL THERAPY. By Alvan L. Barach. 59 Illus. Philadelphia: Lippincott, 1944. 315 pp. Price, $4.00.

HOUSING YEARBOOK, 1944. Chicago: National Association of Housing Officials, 1944. Publication No. N191. 176 pp. Price, $3.00.

INTERNATIONAL RELIEF IN ACTION, 1914–1943. Selected Records, with Notes. By Hertha Kraus. Philadelphia: American Friends Service Committee, 1944. 248 pp. Price, $1.25, cloth ed.; $1.00 paper ed.

POLIOMYELITIS. By Edward C. Rosenow. New York: The International Bulletin. Vol. A44, 1944. 87 pp.

INSTITUTIONS SERVING CHILDREN. By Howard W. Hopkirk. New York: Russell Sage Foundation, 1944. 244 pp. Price, $2.00.

UNDERSTANDING THE YOUNG CHILD. By W. E. Blatz. New York: Morrow, 1944. 278 pp. Price, $2.50.

BUILDING A POPULAR MOVEMENT. A Case Study of the Public Relations of the Boy Scouts of America. By Harold P. Levy. New York: Russell Sage Foundation, 1944. 165 pp. Price, $1.25.

ASSOCIATION NEWS

SECOND WARTIME PUBLIC HEALTH CONFERENCE AND
SEVENTY-THIRD ANNUAL BUSINESS MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
New York, N. Y., October 3–5, 1944
Headquarters: Hotel Pennsylvania

RATES QUOTED BY NEW YORK HOTELS

Second Wartime Public Health Conference and Seventy-third Annual Business Meeting—October 3–5, 1944

	Rooms Without Bath		*Rooms With Bath*	
	Single	*Double*	*Single*	*Double*
Headquarters:				
Pennsylvania, 7th Ave. & 33rd St.			$3.85– 6.60	$5.50– 8.80
Hotels near Hotel Pennsylvania:				
Governor Clinton, 7th Ave. & 31st St.			3.30– 5.50	4.40– 7.70
Martinique, Broadway & 32nd St.	$2.00–2.50	$3.00–4.00	2.75– 3.85	3.85– 5.95
McAlpin, Broadway & 34th St.	2.20–2.75	3.85–4.40	3.30– 6.60	4.95– 8.80
New Yorker, 8th Ave. & 34th St.			3.85– 8.80	5.50–11.00
Allerton House, 143 East 39th St.	2.00–2.25		2.75– 3.00	
Allerton House for Women, 130 East 57th St.	2.00–2.50		3.00– 3.50	
Ambassador, Park Ave. & 51st St.			6.00– 8.00	$8.00–10.00
Astor, Broadway & 44th St.			3.50– 5.00	6.00– 8.00
Barbizon (Women), Lexington Ave. & 63rd St.	2.00–2.75	3.50–4.50	3.25– 3.75	4.50– 5.50
Barclay, 111 East 48th St.			6.00– 7.00	8.00–10.00
Belmont Plaza, Lexington Ave. & 49th St.			4.00– 5.50	6.00– 8.00
Beverly, Lexington Ave. & 50th St.			5.00– 6.00	7.00– 8.00
Biltmore, Madison Ave. & 43rd St.			5.50–12.00	7.50–14.00
Bristol, 129 West 48th St.	1.75–2.00	3.00	2.50– 4.00	3.50– 6.00
Capitol, 8th Ave. & 51st St.	2.50		3.50– 4.00	5.00– 6.00
Carlyle, Madison Ave. & 76th St.			6.00– 7.00	8.00– 9.00
Chesterfield, 130 West 49th St.	1.50–2.00	2.50–3.00	2.50– 3.00	4.00– 6.00
Commodore, Lexington Ave. & 42nd St.			3.50– 5.50	5.50– 8.80
Concourse Plaza, Grand Concourse & 161st St.			3.50– 4.50	5.50– 6.50
Cornish Arms, 311 West 23rd St.			2.25– 3.00	4.00– 4.25
Essex House, 160 Central Park South			6.00– 8.00	8.00–10.00
Fifth Avenue Hotel, 24 Fifth Ave. (9th St.)			5.00– 6.00	7.00– 8.00
Henry Hudson, 353 West 57th St.			2.50– 3.00	3.50– 5.00
Kenmore Hall, 145 East 23rd St.	1.50–2.00	2.50–3.00	2.00– 3.50	3.50– 5.00
Lexington, 48th St. & Lexington Ave.			4.00– 6.00	6.00– 8.00
Luxor Baths Hotel, 121 West 46th St.			2.25– 2.75	4.50– 5.50
Midston House, 22 East 38th St.	2.25–2.50		3.50	4.00– 4.50
New Weston, Madison Avenue & 50th St.			4.00– 6.00	6.00– 9.00
Paramount, 46th St. West of Broadway			3.00– 4.50	4.00– 8.00
Park Central, 7th Ave. & 55th St.			4.00– 5.00	6.00– 8.00
Parkside, 18 Gramercy Park South	2.25		2.75– 3.30	5.00– 6.00
Piccadilly, 227 West 45th St.			3.00– 4.00	4.50– 6.00
Plymouth, 143 West 49th St.			2.50– 3.50	4.00– 5.00
President, 234 West 48th St.			2.50– 4.00	4.00– 5.00
Prince George, 14 East 28th St.			2.50– 4.00	4.00– 7.00
Roosevelt, Madison Ave. & 45th St.			4.50– 8.00	6.50–12.00
Shelton, 49th St. & Lexington Ave.	2.50		3.50– 5.00	5.00– 7.00
Taft, 7th Avenue & 50th St.	2.00–2.50	3.50–4.00	2.50– 5.00	3.50– 8.00
Times Square, 43rd St. & 8th Ave.	2.00–2.50	3.00–3.50	2.25– 3.00	4.00– 5.00
Tudor, 304 East 42nd St.			2.50– 4.00	4.00– 6.00
Victoria, 7th Ave. & 51st St.			3.00– 4.00	4.50– 7.00
Waldorf-Astoria, 50th St. & Park Ave.			7.00–10.00	10.00–12.00
Warwick, 54th St. & 6th Ave.			5.00– 6.00	7.00– 8.00
Wellington, 7th Ave. & 55th St.			3.00– 5.00	4.00– 7.00
Woodstock, 127 West 43rd St.	2.00–2.50	3.50–4.00	3.00– 5.00	4.00– 7.00

NOMINATIONS FOR THE GOVERNING COUNCIL

In accordance with the By-laws of the Association, the Nominating Committee for Governing Council Members consisting of one Fellow from each Section, reports the following nominations for the Governing Council. The By-laws provide that " upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, provided such petition is received fifteen days before the Annual Meeting." The Chairman of the committee is J. J. Bloomfield, Industrial Hygiene Division, U. S. Public Health Service, Bethesda, Md. The other members are: Jessie M. Bierman, M.D., School Health Section; Martha L. Clifford, M.D., Maternal and Child Health Section; Arthur H. Graham, M.D., Epidemiology Section; Leonard Greenburg, M.D., Industrial Hygiene Section; Albert C. Hunter, Ph.D., Food and Nutrition Section; Hugh R. Leavell, M.D., Public Health Education Section; Roy J. Morton, Engineering Section; Hugo Muench, M.D.,* Vital Statistics Section; Sophie C. Nelson, R.N., Public Health Nursing Section; George A. Nevitt, D.D.S., Dental Health Section; William D. Stovall, M.D., Laboratory Section; George M. Uhl, M.D., Health Officers Section.

There are thirty elective councilors on the Governing Council, of whom ten are elected each year. The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in New York City will be elected for the three year term 1944–1947.

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* Alfred J. Lotka, D.Sc., acted as alternate for Dr. Muench when the latter became ill.

Gregoire F. Amyot, M.D.
Provincial Board of Health
Victoria, B. C.

George Baehr, M.D.
New York, N. Y.

Leona Baumgartner, M.D.
Department of Health
New York, N. Y.

Harold D. Chope, M.D.
Rockefeller Foundation
Sao Paulo, Brazil

James A. Crabtree, M.D.
U. S. Public Health Service
Washington, D. C.

Laura A. Draper, R.N.
Community Health Service
Minneapolis, Minn.

Halbert L. Dunn, M.D.
Bureau of the Census
Washington, D. C.

Haven Emerson, M.D.
DeLamar Institute of Public Health
New York, N. Y.

Gordon M. Fair
Harvard University
Cambridge, Mass.

Fred T. Foard, M.D.
U. S. Public Health Service
Denver, Colo.

Wilton L. Halverson, M.D.
State Director of Health
San Francisco, Calif.

C. A. Holmquist
State Department of Health
Albany, N. Y.

Benjamin G. Horning, M.D.
W. K. Kellogg Foundation
Battle Creek, Mich.

H. E. Kleinschmidt, M.D.
American Red Cross
New York, N. Y.

A. J. Lanza, M.D. (Lt. Col., M.C.)
Office of the Surgeon General
War Department, Washington, D. C.

Kenneth F. Maxcy, M.D.
Johns Hopkins University
Baltimore, Md.

Karl F. Meyer, M.D.
University of California
San Francisco, Calif.

Friend Lee Mickle, Sc.D.
State Department of Health
Hartford, Conn.

Harry S. Mustard, M.D.
DeLamar Institute of Health
New York, N. Y.

N. P. Neilson, Ph.D.
University of Utah
Salt Lake City, Utah

Paul Parrot, M.D.
Ministry of Health
Quebec, Que.

J. T. Phair, M.B., D.P.H.
Department of Health
Toronto, Ont.

William H. Sebrell, Jr., M.D.
National Institute of Health
Washington, D. C.

Thomas F. Sellers, M.D.
State Board of Health
Atlanta, Ga.

Charles E. Shepard, M.D.
Office of Coordinator of Inter-American Affairs
Washington, D. C.

Brigadier General James S. Simmons (M.C.)
Office of the Surgeon General
U. S. Army, Washington, D. C.

Henry F. Smyth, Jr., Ph.D.
Mellon Institute for Industrial Research
Pittsburgh, Pa.

James G. Townsend, M.D.
National Institute of Health
Bethesda, Md.

H. A. Whittaker
State Board of Health
Minneapolis, Minn.

Estella F. Warner, M.D.
U. S. Public Health Service
Chicago, Ill.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Addison D. Aldrich, M.D., 402 Vivian St., Houghton, Mich., Director, Houghton-Keweenaw-Baraga District Health Dept.

Laurence M. Blanke, D.O., 36 Court St., Dedham, Mass., Member, Board of Health

Philip I. Boyd, M.D., Antigua, British West Indies, Medical Officer, Leeward Islands Government

Benoit Fortin, M.D., D.P.H., 6 Hotel Dieu, Chicoutimi, Que., Medical Officer of Health, Health Unit

James M. Goto, M.D., Topaz Base Hospital, Topaz, Utah, Chief of Surgical Services

Clara R. Johns, M.D., 515 Lincoln St., Topeka, Kans., Acting Director, Division of Maternal and Child Health, State Board of Health

Alfred C. LaBoccetta, M.D., 4000 N. Front St., Philadelphia, Pa., Supt. and Medical Director, Philadelphia Hospital for Contagious Diseases

Rueben Levenson, M.D., 3476 Fulton St., Brooklyn 8, N. Y., Medical Inspector, New York City Health Dept.

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George Loewenstein, M.D., 25 East Washington, Chicago 2, Ill., Physician and Surgeon

Frank J. Morgan, Walton, N. Y., Director of Farm Relations, Middletown Milk and Cream Co.

Ruth N. Nisbet, M.A., 1370 S. Logan, Denver 10, Colo., Technician, O. P. Baur's Confectionery Co.

Arthur M. Stokes, M.D., Murray Hill, Mt. Morris, N. Y., Superintendent, Mt. Morris Tb. Hospital

DECEASED MEMBERS

John E. Curtis, M.D., Lemmon, S. D., Elected Member 1944, Health Officers Section

George E. Johnson, M.D., Philadelphia, Pa., Elected Member 1934, Health Officers Section

Clifford C. Young, D.P.H., Lansing, Mich., Elected Member 1912, Elected Charter Fellow 1922, Laboratory Section

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

STATE OF WASHINGTON DEPARTMENT OF HEALTH ANNOUNCES THE FOLLOWING OPENING:

Physician as obstetric consultant in Washington State Department of Health. Preferably with 3 years' special residency in obstetrics and gynecology. Salary $5,280 to $6,000 per annum.

Sanitarian. Preferably with public health training and experience. Salary $2,290 to $2,640.

Bacteriologist to take complete charge of local health laboratory. Requirements include college graduation with major in bacteriology and at least one year of employment in a public health laboratory. Salary $190 to $220 per month.

Physician as health officer in county health department in Northwest. Previous public health experience preferable. Entrance salary $440 per month. Permanent position.

Address Lee Powers, M.D., State Director of Health, 1412 Smith Tower, Seattle, Wash.

Wanted: A physician trained in tuberculosis to assume administrative control of the Bureau of Tuberculosis in an eastern city of 200,000 population. Salary $4,500–$5,031 plus cost of living adjustment. Address **Box B,** Employment Service, A.P.H.A.

Wanted: A physician with venereal disease control experience to assume directorship of the Bureau of Venereal Diseases in a large northeastern city. Salary $4,500–$5,000 per year, plus cost of living adjustment and travel allowance. **Box E,** Employment Service, A.P.H.A.

Physician wanted as Director of Maternal and Child Health in western county health department. Preferably with training in pediatrics and venereology. Some venereal disease control work also. Man preferred but woman considered. Must be in good health. Salary $4,500 per year with car and expenses furnished. Position for duration of war. Address **Box S,** Employment Service, A.P.H.A.

Tuberculosis Association in large western city seeks a director of medical social work. Attractive position now open in agency with a dynamic program closely related to official groups. Address **Box D,** Employment Service, A.P.H.A.

St. Louis, Mo., Health Division, Industrial Hygiene Service, seeks two industrial hygienists, either engineers or chemists. Salaries $225 to $250 per month depending on qualifications and experience, plus travel allowances. Address Robert M. Brown, Public Health Engineer, 64 Municipal Courts Bldg., St. Louis 3, Mo.

Wanted: Medical technologists for 550 bed approved California hospital. Give full particulars and state salary desired. Address W. O. Brown, M.D., Kern General Hospital, Bakersfield, Calif.

Public Health Nurses Wanted: Three staff positions available. Generalized program. Annual salary $2,220 to $2,400 plus travel for use of own car. Address Miss Lorilla Britell, Supervisor, King County Health Dept., County-City Building, Seattle 4, Washington.

Health Department of Southern City and County in a rapidly expanding industrial area, population exceeding 200,000, wishes to employ a Director of Division of Preventable Diseases. Salary commensurate with training and experience, $4,100–$4,700 plus allowance for travel. Write **Box P,** Employment Service, A.P.H.A.

Wanted: Bacteriologist or serologist, junior grade, with public health experience preferred, to work in County Laboratory acting in capacity of a State

Branch Laboratory. Permanent position, salary $168 per month with advancement if satisfactory. Apply to Dr. R. G. Beachley, Director of Health and Welfare, Arlington County Health Department, 1800 N. Edison St., Arlington, Va.

Community Health Educator. Wanted a woman, well trained and experienced in modern methods of organizing and conducting health education among neighborhood groups and other adults. Proper personal qualifications essential and would like person having Master's degree. Office with progressive private agency in city, but work chiefly in adjoining suburban and rural areas. Good salary and allowance for automobile expenses. State age, training, positions held, and give references. Address Arthur W. Towne, Secretary, Onondaga Health Association, Loew Building, Syracuse 2, N. Y.

Bacteriologist Wanted with minimum of master's degree in bacteriology and one year's experience in an approved public health laboratory. Woman or draft exempt man, to take charge of newly established, newly equipped laboratory. Must be able to carry out all the usual procedures of a public health laboratory. Write full details including minimum starting salary requirement. All letters including vitae and photo will be promptly acknowledged. Address E. E. Palmquist, M.D., King County Health Department, 402-L County-City Building, Seattle 4, Wash.

Wanted: A Vital Statistician to assume directorship of the Bureau of Vital Statistics in a large northeastern city. Salary $2,500–$3,100, plus cost of living adjustment. Write **Box G,** Employment Service, A.P.H.A.

Wanted: County Public Health Nurse for midwestern state. Present salary $160 per month and travel allowance. Must have had previous experience in public health. Own and drive car. Address District Health Unit 2, West Branch, Mich.

Physician—public health pediatrics. To assist director of maternal and child health in a large California County Health Department. Major duties, conducting of infant and preschool health conferences and school examinations. Beginning salary $390 a month and travel allowance. California license required. Training and experience in pediatrics or public health or both. Immediately available. Address William C. Buss, M.D., Kern County Health Dept., Bakersfield, Calif.

Wanted: Superintendent and Medical Director for tuberculosis sanatorium having 65 bed capacity and average of 35 patients per day. Salary $4,380 with $300 annual allowance for car. Write M. P. Hunter, City Manager, Roanoke, Va.

Public Health Nurse, supervisory work in orthopedics, must have certificate in public health. Salary $2,050 with maintenance of car, meals and upkeep while in the field. Address Dr. R. G. Beachley, Director of Health & Welfare, Arlington Co. Health Dept., 1800 N. Edison St., Arlington, Va.

Wanted: Staff nurses for 200 bed municipal tuberculosis hospital. Salary $190 per month, $35 per month deduction if maintenance desired. Educational program with opportunity for postgraduate work with University credit planned. For full information write Superintendent of Nurses, Firland Sanatorium, Richmond Highlands, Wash.

Wanted: Health officer for County-City health unit. Good opportunity for right man. Salary to start $4,500 per year and travel expenses. Position permanent. Address G. F. Campana, M.D., Acting State Health Officer, Bismarck, N. D.

Wanted: Bacteriologist to direct and operate a modern public health laboratory in southeastern city of 70,000 population. Examinations 1,500 to 2,000 a month, largely serological and milk tests. Salary available to start $2,400 per annum increasing to $2,700 for satisfactory service. Assistant bacteriologist also needed, with available salary of $1,800 increasing to $2,000 if satisfactory service is shown. Write **Box N,** Employment Service, A.P.H.A.

Wanted: School dentist to direct and operate school dental program in southeastern city of 70,000 population. Salary available starting at $3,600 and increasing to $4,000 for satisfactory service. For further particulars write **Box Y,** Employment Service, A.P.H.A.

Wanted: An assistant in Health Division Council of Social Agencies, interested in community organization and health education. Large city and metropolitan area. State age, training and experience. Write **Box X,** Employment Service, A.P.H.A.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK 19, N. Y.

In view of the current active demand for trained and experienced persons in public health, it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

ENGINEER

Well qualified public health engineer seeks responsible position in New York metropolitan area. **E-480**

Sanitary Engineer, C.E. 22 years' experience as sanitary engineer, 14 as director in state health department, now employed. Desires change. Location immaterial. **E-481**

LABORATORY

Research bacteriologist - veterinarian, now in civil service, desires change to direct or indirect war work. P-3 classification. Considerable laboratory and field experience. Used to foreign travel; will go anywhere. Steady hard worker. **L-470**

Bacteriologist, 29, draft exempt, 3 years' experience public health laboratory, 2 years' experience industrial organization. Experienced in investigation and control activities on water, sewage, and sanitation as chemist, bacteriologist and serologist in syphilis and enteric diseases. **L-465**

Bacteriologist-Serologist, male, with 20 years' experience in state and municipal public health laboratories, last 10 years in administrative capacity, now in charge of a midwest diagnostic laboratory, wishes to make a permanent change. **L-427**

MISCELLANEOUS

Public Health Nurse. B.S. in nursing, William and Mary College, age 53, seeks position as coördinator of public health nursing, educational director, or director student nurse public health program. Prefers Middle Atlantic States. **M-452**

Sanitarian-Veterinarian, age 23, seeks employment in public health field. Experienced as veterinarian, serologist, sanitary inspection. **M-460**

NEWS FROM THE FIELD

PENICILLIN AND SYPHILIS

According to the *Venereal Disease War Letter* issued by the U. S. Public Health Service, Division of Venereal Diseases, Washington, D. C., in cooperation with state health departments, large-scale use of penicillin in the treatment of syphilis is being undertaken by the U. S. Public Health Service and a number of state health departments. J. R. Heller, Jr., Medical Director and Chief of the Venereal Disease Division of the Service, has indicated that several hundred patients with syphilis will be treated with penicillin at rapid treatment centers within a year under this program.

According to Dr. Heller, in several centers studies of the effectiveness of penicillin in the treatment of syphilis will be conducted in collaboration with the Penicillin Panel, Subcommittee on Venereal Diseases of the National Research Council. The data from selected cases will make possible further evaluation of different time-dosage schedules, the most effective of which have not as yet been fully established. Evidence of the value of penicillin in the treatment of syphilis, on the other hand, is already sufficient to warrant large-scale application of the therapy in the interest of both public health and the prospects for recovery of patients for whom the treatment is appropriate.

Three patients treated for early syphilis by U. S. Public Health Service physicians at the U. S. Marine Hospital, Staten Island, N. Y., in 1943 (*A.J.P.H.*, Dec., 1943) remain free of clinical or serologic evidence of syphilis as the period of post-treatment observation approaches a year.

Since the Staten Island research, additional studies have been conducted by the Army, the Navy, and the U. S. Public Health Service in collaboration with the Penicillin Panel. More than 1,000 patients with syphilis in various stages have been treated with penicillin. Accumulating evidence indicates that penicillin does have value in the treatment of syphilis of all types, although additional time must pass before permanence of results can be judged. In many of the cases treated primary and secondary lesions have healed quite promptly. *Treponema pallidum* as observed by darkfield examinations have disappeared in 12 to 24 hours, and blood serologic tests have reversed from positive to negative.

The use of penicillin in this program will be restricted to patients with untreated, early syphilis, darkfield positive, and patients for whom 6 months' or a year's follow-up seems possible. Two schedules of therapy are being considered in the U. S. Public Health Service program—a 4 day schedule and an 8 day schedule.

The first group of State Rapid Treatment Centers, operating in cooperation with the U. S. Public Health Service physicians assigned to state health departments, which will participate are at San Diego, Calif.; Denver and Pueblo, Colo.; Ocala, Wakulla, and Jacksonville, Fla.; Pineville and New Orleans, La.; Ann Arbor, Mich.; Meridian and McLain, Miss.; Albuquerque, N. M.; Charlotte, N. C.; Rush Springs, Okla.; Columbia, S. C. (3 centers); Nashville, Chattanooga, and Memphis, Tenn.; San Antonio, El Paso, and Waco, Tex.; Richmond, Va.; Seattle and Grand Mound, Wash.; and Washington, D. C. Federal Rapid Treatment Centers participating are at

Birmingham, Ala.; Hot Springs, Ark.; Pensacola, Fla.; Savannah and Augusta, Ga.; Greenwood, Miss.; St. Louis, Mo.; Durham, N. C.; Norfolk, Va.; and Charleston, W. Va.

Clinics and physicians are urged to refer suitable patients to nearby RTC's.

RED CROSS TO SUPPLY MEASLES GLOBULIN

The American Red Cross has announced its expectation that by September 1 measles globulin prepared from blood donated by the American people to the Red Cross for the fighting forces will be available for distribution through health departments. According to the announcement, health departments will apply to the Red Cross in Washington. It will be distributed subject to the condition that the person receiving the globulin may not be charged for it. Manufacturers and those concerned with distribution may not make any profit. The costs of processing and shipping are to be paid by the health department or other agency which is given a permit by the Red Cross. The price for an adult dose is estimated at about $1.10.

The globulin is separated from blood by the Cohn process developed at the Harvard Medical School by Dr. Edwin J. Cohn, and under a coöperative project with the Office of Scientific Research and Development.

U. S. PUBLIC HEALTH SERVICE HEALTH EDUCATION FELLOWSHIPS AVAILABLE FOR MEN

The U. S. Public Health Service announces that, through the coöperation of the National Foundation for Infantile Paralysis and the W. K. Kellogg Foundation, additional fellowships for health education are now available for qualified men of certain Selective Service classifications as well as for women.

Fellowships will lead to a Master of Science degree in Public Health. They will provide for 12 months' training in public health education, 3 months of which will be supervised field experience; $100 a month for 12 months, full tuition and travel. Training will be given either at the University of North Carolina, Yale University, or University of Michigan.

Forms for application for fellowships may be obtained from the Surgeon General, U. S. Public Health Service, Washington 14, D. C. Applications must be accompanied by a transcript of college credits and a small photograph, and must be in the office of the Surgeon General not later than August 15, 1944.

INFANTILE PARALYSIS GRANTS

The National Foundation for Infantile Paralysis announces twenty-seven grants totalling $1,128,770 for the nation-wide fight against infantile paralysis. The grants have been made to leading universities, laboratories, and other organizations throughout the country and will be operating by July 1. Three long-term programs, each covering a 5 year period, are included. Two are for the purpose of improving knowledge in the field of physical medicine made to the Medical School of the University of Minnesota and Northwestern University Medical School, and the third, made to the University of Michigan School of Public Health, will finance and operate an expanded virus study unit.

NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

The following are the new officers of the Northern California Public Health Association elected at a recent meeting:

President—Dwight M. Bissell, M.D., San Jose
President-elect—Edward Reinke, Berkeley
Vice-President—Ann Wilson Haynes, San Francisco
Secretary—Margaret Beattie, Berkeley
Treasurer—Helen Hartley, Stockton
Representative on Regional Board, Western Branch, A.P.H.A.—Malcolm H. Merrill, M.D.

El Presidente

de la

República de Cuba

En uso de las facultades que le están conferidas por las leyes y a propuesta del Consejo Supremo de la Orden

Confiere:

la Condecoración de la Orden Nacional de Mérito

Carlos J. Finlay

en el grado de

Comendador

a la Sociedad Americana de Salubridad

Dado, firmado y sellado por el Ejecutivo de la República y refrendado por el Ministro de Salubridad y Asistencia Social, Gran Canciller de la Orden, en el Palacio de la Presidencia, en la Habana, a 3 de Diciembre de 1944.

Presidente.

Primer Ministro.

Ministro de Salubridad y Asistencia Social,
Gran Canciller de la Orden.

Dr. Alberto Recio, Minister of Public Health of Cuba recently announced the opening of the National Institute of Hygiene in Havana which took place on May 17, 1944. On the occasion President Batista presented decorations of the Order of Carlos J. Finlay to Brigadier General James S. Simmons, Director of Preventive Medicine, Office of the Surgeon General, U. S. Army, Washington, D. C.; Colonel Harry Plotz, Chief of the Division of Virus and Rickettsial Diseases, Army Medical School, Washington, D. C.; Dr. Rolla E. Dyer, Director of the National Institute of Health, Bethesda, Md.; Dr. Reuben Kahn, University of Michigan, Ann Arbor, Mich.; Dr. Henry Hanson, Commissioner of Health of the State of Florida, Jacksonville, Fla.; and Dr. A. A. Moll, Executive Secretary of the Pan American Sanitary Bureau, Washington, D. C.

At the same time the Cuban Government presented decorations to the Rockefeller Foundation, the American Public Health Association (reproduced above), and a posthumous award to the American Yellow Fever Commission in honor of the great services rendered to yellow fever control.

UNIONS APPROVE PREËMPLOYMENT SYPHILIS EXAMINATIONS

Dr. J. C. Geiger, Director of Public Health, San Francisco, Calif., announces a new procedure in the Industrial Venereal Disease Control Program. The Bay Area Metal Trades Council, of the American Federation of Labor, unanimously passed a resolution approving voluntary preëmployment serologic examinations which are conducted by management in coöperation with health departments.

Under the operation of this program voluntary preëmployment serologic specimens will be secured by medical representatives of management. These specimens will be submitted to the laboratory of the City and County of San Francisco Department of Public Health. The results of these laboratory findings are referred to the local Division of Venereal Diseases. Information is kept strictly confidential between the health department and the individual tested. Information pertaining to the results of these examinations is reported neither to labor unions nor to management.

The Division of Venereal Diseases assumes responsibility of advising employees of positive serologic examinations. Industry is advised that it is not justified in considering the presence of syphilis in an employee under treatment or adequately treated as a cause for discharge from employment. Such an attitude is detrimental to the war effort, a hindrance to progressive industrial venereal disease control, and leads to plant management-labor union conflict.

"Latent syphilis is not a danger to industry. It is nerosyphilis and cardiovascular syphilis, the results of latent syphilis, which present the potential industrial hazard. The Health Department and not industry or labor unions must assume the responsibility for requiring adequate treatment of the known, untreated, or inadequately treated syphilitic industrial worker. Only those workers who are not amenable to, or who do not respond satisfactorily to adequate treatment, should be placed in new occupations commensurate with their physical condition. Venereal disease case finding and case holding can be best managed by the Health Department as an unbiased official agency legally responsible for these activities.

"Failure of the employee to submit to voluntary preëmployment blood tests under this industrial venereal disease control program will in no way jeopardize that person's chances of employment. The program, with the assistance of management and labor unions, will be put into practice in some of the large and small industrial plants under the direction of the Division of Venereal Diseases in San Francisco.

"From the start of this program labor has coöperated fully with the local health agency. The establishment of this program was made possible by the assistance of the California Social Hygiene Association, the coöperation of union officials, and the efforts of members of the Division of Venereal Diseases."

SIGNIFICANCE OF THE UNION HEALTH CENTER

Dr. Manfred Bowditch, the Director of the Division of Occupational Hygiene in the Massachusetts Department of Labor and Industries, has called the attention of the Managing Editor to the *Annual Report* for 1943 of the Union Health Center, New York City. This volume carries a foreword by Dr. Haven Emerson in appreciation of Dr. George M. Price, the founder of the Union Health Center, who died in 1942.

As Dr. Leo Price, the present director, says in his introduction, this report for 1943 is supplemented by historical and other data compiled in the course

of 31 years of experience in an uncharted field of medical service.

"The Union Health Center is a unique institution in American industrial medicine. Prior to its establishment there were numerous medical service plans but they were instituted and administered by employers, management and other agencies. They did not represent the effort of workers in an industry to solve their own health problems through their own coöperative effort. The difference between the ladies' garment workers' health program and others lies, therefore, in the fact that it was conceived and operated by a labor union.

"Today the Center is so large, both in physical size and scope of service, that it can no longer be regarded as an experiment. It stands as a proof that medical service for labor, operated under the control of labor, works and has a valuable place in the community."

No one interested in the subject of group medicine or in the provision of medical services to the general community can fail to be interested in this report.

DR. FERRELL TO DIRECT MARKLE FOUNDATION

John A. Ferrell, M.D., Dr.P.H., has been appointed Medical Director of the John and Mary R. Markle Foundation of New York, effective July 1. Since 1910 Dr. Ferrell has been connected with the Rockefeller Sanitary Commission and the International Health Division of the Rockefeller Foundation, most recently as Associate Director for the work of the Foundation's health program in the United States, Canada, and Mexico.

The Markle Foundation was established in 1927 and since 1935 has limited its activities to research in the medical and physical sciences and the area of its operations to the United States and Canada. The scope of the program has recently been broadened during the war to include the virus diseases and tropical diseases. According to the announcement, the directors of the Markle Foundation contemplate the formulation of a long-term program of research in the fields of the medical and the physical sciences when conditions become favorable and anticipate the appointment of a permanent medical director. Toward the attainment of this goal the directors will have the assistance of Dr. Ferrell.

DR. STRODE APPOINTED DIRECTOR OF INTERNATIONAL HEALTH DIVISION

The Rockefeller Foundation has announced the appointment of George K. Strode, M.D., as Director of the International Health Division of the Foundation, succeeding W. A. Sawyer, M.D., who has retired as Director to become Health Director of the United Nations Relief and Rehabilitation Administration, Washington. Dr. Strode's association with the Foundation goes back more than two decades during which he has been assigned to a variety of responsibilities in several sections of the globe. Recently he has been in charge of the European office of the Foundation as Associate Director. He is a graduate in medicine from the University of Pennsylvania and a graduate in public health from Harvard School of Public Health.

KANSAS PUBLIC HEALTH ASSOCIATION

At a meeting held early in June the Kansas Public Health Association elected the following new officers to serve for the forthcoming year:

President—Leon R. Kramer, D.D.S., Topeka
President-Elect—Paul Haney, M.S., Lawrence
Vice-President—J. E. Wolfe, M.D., Wichita
Treasurer—Evelyn Hannon, R.N., Topeka
Secretary—Jane Taylor, R.N., Topeka
Executive Committee—D. D. Carr, M.D., Topeka; L. W. Rowles, D.V.M., Topeka; Jeanette Rosenstock, R.N., Topeka

CHILDREN'S BUREAU STAFF CHANGES

A. L. Van Horn, M.D., has been appointed Director of the Division of Health Services of the Children's Bureau, U. S. Department of Labor, Washington, succeeding Edwin F. Daily, M.D., who is on leave to serve with the U. S. Army as a Major in the Medical Corps. Dr. Daily will serve in reëstablishing medical and hospital services in some of the liberated countries. Betty Huse, M.D., has replaced Dr. Van Horn as Assistant Director for Crippled Children in the Division of Health Services of the Bureau with which she has been associated since 1939.

Dr. Van Horn, who is a native of North Carolina, is a graduate in medicine of the University of Michigan Medical School, and was at one time Chief of the Bureau of Child Hygiene of the Ohio State Department of Health. Since 1936 he has been regional medical consultant for crippled children and for maternal and child health programs with the Children's Bureau, and in 1937 was made Assistant Director of the Crippled Children's Division, becoming Director in 1941.

Dr. Huse, who is a native of Nebraska, is a graduate in medicine from Cornell Medical College and was at one time connected with that institution in the department of pediatrics.

Dr. Daily has been in charge of the emergency maternity and infant care program administered by the Children's Bureau under which nursing and hospital care are given service men's wives and infants. He is a graduate in medicine of the University of Colorado.

MEDALS AWARDED FOR SERVICE ON TYPHUS COMMISSION

It has recently been announced that medals for exceptionally meritorious service have been awarded to Captain Charles S. Stephenson, U. S. Navy; Dr. Rolla E. Dyer, Assistant Surgeon General, U. S. Public Health Service; and Brigadier General James S. Simmons of the U. S. Army; all members of the United States of America Typhus Commission concerned with the control of typhus among United States armed forces overseas and with the prevention of the introduction of typhus fever into the United States.

PERSONALS

Central States

CHARLES F. ATKINSON, M.D.,† Health Officer of Missaukee, Kalhaska, Crawford and Roscommon Counties Health Unit, Traverse City, Mich., has been placed in charge of the Grand - Traverse - Leelanau County Unit, Traverse City, Mich., succeeding BUELL H. VAN LEUVEN, M.D.,† Saulte Sainte Marie, Mich.

LORIN E. KERR, M.D.,* who has been Health Officer of Lorain County, Ohio, has resigned to accept appointment as Surgeon (R), U. S. Public Health Service, and has been assigned as Regional Medical Officer of the War Food Administration with offices in Portland, Ore.

WILLIAM H. RUMBEL, M.D., of Hubbard, Ohio, was appointed Director of the Bureau of Dental Hygiene. Dr. Rumbel, who took over the post June 12, succeeds STEPHEN V. LUDDY, who left the State Health Department to take a position with the City Health Department of Alexandria, Va.

JAMES P. SHARON, M.D.,† Mount Pleasant, Mich., has resigned as Director of the Isabella County Health Unit to accept a position with the Mississippi State Board of Health, Jackson, Miss.

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* Fellow A.P.H.A.
† Member A.P.H.A.

FRANK F. TALLMAN, M.D.,† who has been Director of Mental Hygiene in the State of Michigan for the past two and one-half years, is resigning to accept the position of Commissioner of Mental Disorders in the Ohio State Department of Public Welfare, Columbus, Ohio. There are 15 hospitals for the mentally ill, feebleminded, and epileptic in the Division of Mental Diseases which Dr. Tallman will supervise, with a population of about 27,000 patients. In addition to his work with the hospitals, Dr. Tallman will be responsible for a receiving hospital program, and a state-wide program of mental hygiene.

Eastern States

MAJOR MEYER J. PLISHNER,† Sanitary Corps, AUS, of Framingham, Mass., after his recent promotion was assigned to the Medical Intelligence Division of the Surgeon General's office, Washington, D. C., where he is working under Lt. Colonel Gaylord W. Anderson, M.D.*

WILBUR A. SAWYER, M.D.,* formerly Director of the International Health Division, Rockefeller Foundation, New York, and who was recently appointed Director of Health, United Nations Relief and Rehabilitation Administration, Washington, now makes his headquarters with UNRRA at 1344 Connecticut Avenue, N.W., Washington, D. C.

HUGH H. SMITH, M.D.,† of the staff of the International Health Division, Rockefeller Foundation, has been appointed Regional Director of the International Health Division for the United States, Canada, and Mexico to succeed JOHN A. FERRELL, M.D., DR.P.H., who has become Medical Director of the John and Mary R. Markle Foundation, New York, N. Y. Dr. Smith has been a member of the staff of the International Health Division since 1930, serving in the New York Laboratories of the Division, in Jamaica, Brazil, Colombia and Great Britain, where he has been stationed for the last three years.

CLAIRE W. TWINAM, M.D., DR.P.H.,† former Acting Superintendent of Lakeville State Sanatorium, Middleboro, Mass., has been appointed to succeed CARL C. MACCORISON, M.D., as Superintendent of North Reading State Sanatorium, North Wilmington, Mass. In September, 1943, he was appointed Superintendent and Medical Director of the King County Tuberculosis Hospital, Seattle, Wash.

Southern States

ALBERT L. CHAPMAN, M.D., M.P.H.,† P.A. Surgeon, U. S. Public Health Service, has been detailed to Charleston, W. Va., as the Deputy Health Commissioner. Dr. Chapman assumed his duties on June 19. The Deputy Health Commissioner will be under the administrative direction of the State Health Commissioner to act as assistant in administration; to coördinate the activities of all bureaus and divisions of the department; to act for the State Health Commissioner in his absence; and to do related work as required.

ARTHUR P. RICHARDSON, M.D., Head of the Department of Pharmacology of the University of Tennessee, Knoxville, Tenn., has been appointed Head of the Division of Pharmacology of the Squibb Institute for Medical Research, New Brunswick, N. J., to become effective October 1, 1944. Dr. Richardson will replace

* Fellow A.P.H.A.
† Member A.P.H.A.

H. B. VANDYKE, M.D., who has accepted the position as Head of Pharmacology, College of Physicians and Surgeons, Columbia University, New York, N. Y.

WALTER J. RILEY, M.D.,† formerly of Sutton, W. Va., has been named Health Officer of District No. 4 at Weston, W. Va., to succeed CLAUDE A. THOMAS, M.D.

HENRY VAN D. STEWART, M.D.,† formerly of Little Rock, Ark., was recently appointed in charge of the Perry County Department of Health, Hazard, Ky.

DR. HAZEL K. STIEBELING has been appointed Chief of the Bureau of Human Nutrition and Home Economics of the Department of Agriculture, effective June 30, to succeed DR. HENRY C. SHERMAN, who will return to Columbia University. Dr. Stiebeling has for fourteen years been a leading nutrition expert of the Bureau. She was a member of the technical group at the United Nations Conference on Food and Agriculture at Hot Springs, Va. She is now a consultant of the United Nations Relief and Rehabilitation Administration.

JAMES P. WARD, M.D.,* Greenville, Miss., Director of the Washington County Health Department, has resigned to accept a position with the Standard Oil Company as physician on the Island of Aruba.

PAUL A. WRIGHT, M.D.,† Jackson, Ky., has been named Health Officer of Fulton County, Ky., succeeding Jesse M. Dishman, M.D., who was recently transferred to Benton, Ky.

Western States

JACOB C. GEIGER, M.D.,* Director of Public Health of the City and County of San Francisco, Calif., was granted the decoration "Al Merito" by the Ecuadorian Government for "distinguished service, for noteworthy and indomitable leadership in the advancement of public health in the Americas."

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Association for the Advancement of Science—Annual Meeting and Annual Science Exhibition. Cleveland, Ohio. September 11–16.

American Congress of Physical Therapy—23rd Annual Scientific and Clinical Session. Hotel Statler, Cleveland, Ohio. September 6–9.

American Dietetic Association—27th Annual Meeting. Palmer House, Chicago, Ill. October 25–27.

American Public Health Association—Second Wartime Public Health Conference and 73rd Annual Business Meeting. Hotel Pennsylvania, New York, N. Y. October 3–5.

American Public Works Association. St. Paul, Minn. September 24–27.

American Water Works Association—
North Dakota Water and Sewage Works Conference—Grand Pacific Hotel, Bismarck, N. D. September 12–13.
Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 13–14.
Rocky Mountain Section—Cosmopolitan Hotel, Denver, Colo. September 21–22.
American Public Works Congress—St. Paul, Minn. September 24–27.
Southwest Section—Hotels Stephen F. Austin and Driskill, Austin, Tex. October 17–19.
Missouri Valley Section—President Hotel, Kansas City, Mo. October 23–24.
California Section—Biltmore Hotel, Los Angeles, Calif. October 24–26.
West Virginia Section—Chancellor Hotel, Parkersburg, W. Va. October 26–27.
New Jersey Section—Atlantic City, N. J. November 2–4.
Four States Section—Benjamin Franklin Hotel, Philadelphia, Pa. November 8–10.
Florida Section—Suwanee Hotel, St. Petersburg Fla. November 16–18.

Association of Military Surgeons of the United States. Hotel Pennsylvania, New York, N. Y. November 2–4.

Biological Photographic Association—14th

Annual Meeting. Binghamton, N. Y. September 7–9.

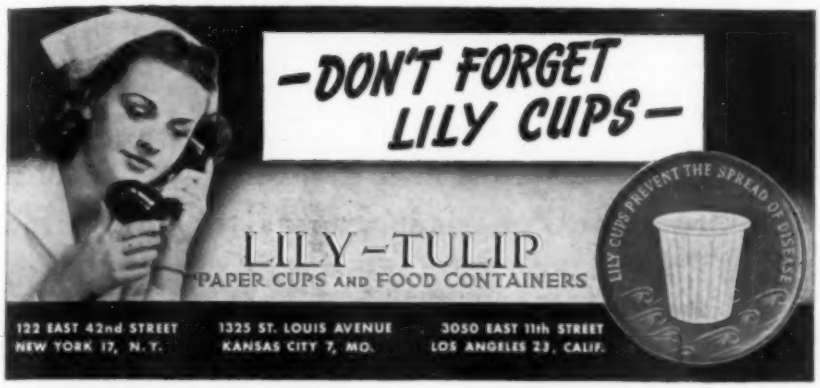
Federation of Sewage Works Associations. William Penn Hotel, Pittsburgh, Pa. October 12–14.

International College of Surgeons—Ninth Annual Assembly. Benjamin Franklin Hotel. Philadelphia, Pa. October 3–5.

National Chemical Exposition—Sponsored by the Chicago Section of the American Chemical Society. The Coliseum, Chicago, Ill. November 15–19.

New York State Association of Milk Sanitarians—Annual Meeting. Hotel Syracuse, Syracuse, N. Y. September 20–22.

Pennsylvania Sewage Works Association—Seventeenth Annual Conference. William Penn Hotel, Pittsburgh, Pa. October 12–14.



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Publications of the A.P.H.A.

Basic Principles of Healthful Housing. 2nd ed., 1939, 32 pp. $.25. Report of the Committee on the Hygiene of Housing.

Community Organization for Health Education. Report of the Committee. Clair E. Turner, Chairman. 1941. 136 pp. Price, $.09.

Control of Communicable Diseases. Revised. 1940. Second Printing with Additions, 1943. Size 4½" x 7½". 96 pp. $.25.

Housing for Health. Papers presented under the auspices of the Committee on the Hygiene of Housing of the American Public Health Association. 1941. 221 pp. $1.00.

Occupational Lead Exposure and Lead Poisoning. A Report Prepared by the Committee on Lead Poisoning of the Industrial Hygiene Section of the American Public Health Association. 1943. 67 pp. $.75.

Panum on Measles. By P. L. Panum (translation from the Danish). Delta Omega ed., 1940. 111 pp. $2.50.

Recommended Methods of Procedure for Bacteriological Examination of Shellfish and Shellfish Waters. 1944. 12 pp. $.25.

Standard Methods for the Examination of Dairy Products—Microbiological, Bioassay and Chemical. 8th ed., 1941. 288 pp. $3.00.

Standard Methods for the Examination of Water and Sewage. 8th ed. 1936. 309 pp. $2.50.
Physical and chemical examination of water and sewage, microscopical examination of water and bacteriological examination of water.

Swimming Pools and Other Public Bathing Places, Recommended Practice for Design, Equipment and Operation of. 1942. 56 pp. $.50.

Transactions of the Eighth Institute on Public Health Education. From the 70th Annual Meeting of the American Public Health Association, held in Atlantic City, N. J., 1941. 1942. 126 pp. $1.50.

Reprints from the American Journal of Public Health

Desirable Minimum Functions and Organization Principles for Health Activities. An official Declaration of the American Public Health Association. [1941.] 10 pp. Single copies free. Three or more copies 5c each.

Development of Tuberculosis in a Controlled Environment. By Robert Plunkett, M.D., George W. Weber, M.D., William Siegal, M.D., and Rose R. Donk, M.D. [March, 1940.] 8 pp. 15c.

Epidemiological and Experimental Observations on the Possible Significance of Rodents in a Suburban Epidemic of Poliomyelitis. By Claus W. Jungeblut, M.D., and Gilbert Dalldorf, M.D. [February, 1943.] 4 pp. 10c.

The Evolving Pattern of Tomorrow's Health: I. Prerequisites to Improved Public Health, by Joseph W. Mountin, M.D. II. The Post-War City, by C.-E. A. Winslow, Dr.P.H. III. The Health Department of the Future, by Henry F. Vaughan, Dr.P.H. IV. The Health Worker of the Future, by Reginald M. Atwater, M.D. [December, 1943.] 24 pp. 25c.

Improvement of Local Housing Regulation Under the Law. An Exploration of Essential Principles by Subcommittee on Housing Regulation of the Committee on the Hygiene of Housing, the American Public Health Association. [November, 1942.] 16 pp. 25c.

Laboratory Methods Used in Determining the Value of Sulfadiazine as a Mass Prophylactic Against Meningococcic Infections. By Colonel Dwight M. Kuhns, M.C., USA, and Captain Harry A. Feldman, M.C., AUS. [December, 1943] 8 pp. 10c.

Post-War Implications of Fluorine and Dental Health. Epidemiological Aspects, H. Trendley Dean, D.D.S.; The Problem as It Relates to the Water Works Engineer, Raymond J. Faust, C.E.; The Use of Topically Applied Fluorine, John W. Knutson, D.D.S., and Wallace D. Armstrong, M.D.; From the Viewpoint of Public Health Dentistry, Allen O. Gruebbel, D.D.S. [February and March, 1944.] 28 pp. 25c.

Protection of Water and Food Supplies in An Emergency. G. E. Arnold. [October, 1942.] 8 pp. 15c.

Pyrex Suspensions in Turbidimetric and Colorimetric Determinations: Standards of Comparison for Bacterial Suspensions and in the Resazurin Test. By Francis J. Hallinan. [February, 1943.] 4 pp. 10c.

Surveys of the Nutrition of Populations: Description of the Population, General Methods and Procedures, and the Findings in Respect to the Energy Principle (Calories) in a Rural Population in Middle Tennessee. John B. Youmans, E. White Patton, and Ruth Kern. [December, 1942, and January, 1943.] 24 pp. Uncovered, 20c, covered, 25c.

To a Few Governors and Many Politicians. [Editorial, October, 1942.] 1 p. 10c.

Typhoid Vaccine Studies: Revaccination and Duration of Immunity. By Don Longfellow, M.D., and George F. Luippold. [November, 1940.] 7 pp. 15c.

Uniformity in Control of Communicable Diseases. By Haven Emerson, M.D. [February, 1942.] 5 pp. 10c.

Ventilation and Atmospheric Pollution. E. R. Hayhurst, Chairman. [1941–1942 Year Book, March, 1942.] 17 pp. 20c.

Ventilation and Atmospheric Pollution. E. R. Hayhurst, Chairman. Suggested Standards; Defense Ventilation and Air Conditioning Problems, C. P. Yaglou; Standard Methods for the Examination of Air, Emery R. Hayhurst; Physical Procedures in Air Analysis, C. P. Yaglou; Chemical Methods in Air Analysis—Cadmium and Hydrogen Sulfide, F. H. Goldman; Dust Procedures in Air Analysis, J. J. Bloomfield; Bacteriologic Procedures in Air Analysis, William F. Wells [July, 1943.] 7 pp. 15c.

What Can the Dental Health Worker Teach Regarding Nutrition and Diet? By William R. Davis, D.D.S. [July, 1941.] 8 pp. 15c.

For Free Distribution Bibliography on Public Health and Applied Topics, 1943 (21st Ed.). 25 pp. Brief Description of the American Public Health Association.

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